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Garth Graves' **Cedar Blanket Chest Design Alternatives**

Popular Woodworking

Issue #78 May 1994

laminated turning
custom v block
nail storage cabinet

finish nailer review

contemporary desk

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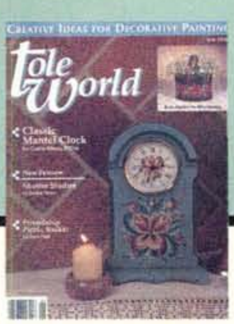

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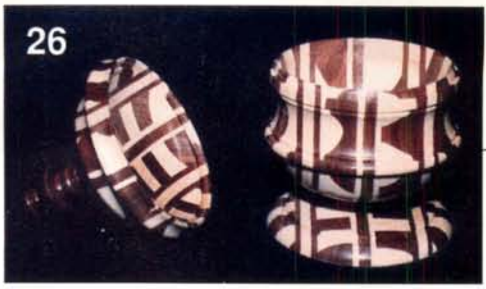

The Cover Bar

Garth Graves is a frequent contributor to *Popular Woodworking*. In this issue, Garth offers several blanket chest variations using simple and easy methods of frame and panel construction. He is the author of *The Yacht Craftsman's Handbook* ©1992, McGraw Hill, Blueridge Summit, PA. He and his wife live in San Diego, California.

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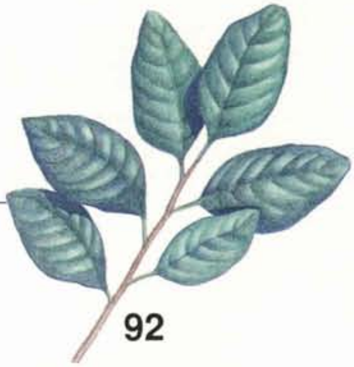
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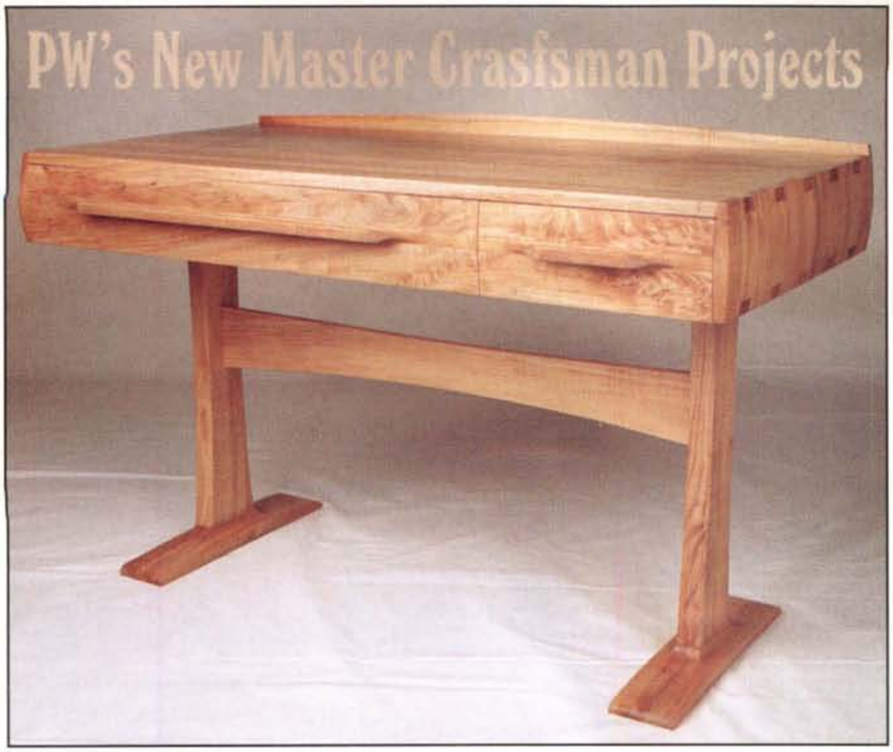
Turnings



In this issue, we begin a new level of woodworking project—The *Popular Woodworking Master Craftsman Project*. As the name implies, these projects require a higher degree of skill. But that doesn't mean beginning woodworkers can't attempt and successfully complete them. Skill doesn't mean you can cut a mortise and tenon with a carving knife and one hand tied behind your back. Skill is a state of mind and a willingness to try and succeed.

If you are new to woodworking and want to attempt one of these classic pieces, do it. Even if you're an accomplished woodworker, you'll find these projects challenging in the process and rewarding in the final outcome. We think you'll find the new projects mentally challenging as well. Whatever your level of skill, these projects are different from the others we've presented in these pages over the years.

The most obvious thing our regular readers will notice is the missing Cutting List. The critical dimensions are given in the text and on a few necessary drawings. All the other measurements will be determined by you as you progress through the piece.

You don't need to own the latest in machinery to make these pieces either. A few basic hand tools, a table saw and a drill press are all that are needed. There's a lot of pleasure to be had in fashioning beautiful dovetails on a curved surfaces by hand.

The projects are by Contributing Editor Ken Sadler. Ken designed and built them for his customers during his long and profitable woodworking career. In the past, we have presented other projects by Ken in our regular format and they've been very popular. We're looking forward to presenting these new challenges in each issue and await your comments.

Speaking of Skill

A lot of the tools we use in our pursuit of hobby and profession have been around for as long as most of us can remember. The basic hand tools have evolved. The tools that have replaced a lot of them still perform the same functions of cutting, boring, shaping and smoothing. Only now they're electrified, computer chip controlled and made from materials that were unknown as little as 25 years ago. So how did they evolve?

The first power tool I remember seeing was a circular saw. I never thought about its origins, only how much easier it was for Dad to cut a piece of plywood in half when he built my tree house.

Believe it or not, the circular saw began life as a machete in the cane fields of Louisiana in the early 1920's. The whole story is presented in "The Tool Wright's Corner" beginning on page 76.

Turning

We get letters asking for turning articles and frankly, I wish we could present more than we do. I certainly want to encourage any of you out there who spend a lot of time standing in front of the lathe to send in photos of what you're making. We'd like to consider your projects for publication. Hopefully, I'll get a little more time in the shop to produce a project now and then. In the mean time, there's a beautiful laminated early American spice and tea canister by William Scherer from Hutchinson, Minnesota, beginning on page 26.

Rob

Safety Note

Safety is your responsibility. The manufacturers place safety devices on their equipment for a reason. In most of the photos you see in *PW*, these have been removed to provide clarity. In some cases we'll use an awkward body position so you can better see what's being demonstrated. Please don't copy us. Think about each procedure you're going to perform beforehand. Think ahead.

Letters

We welcome your comments, pro or con, about articles we publish. Send your letters to: Editor, *Popular Woodworking*, 1041 Shary Circle, Concord, CA 94518. Letters may be edited for publication.

Myth Debunked?

Mr. McAleer could have saved himself a lot of frustration in his search for confirmation of his wood movement theory relating to the bark side of deck boards (PW 77). I would think the book *Understanding Wood* by R. Bruce Hoadly is assumed prerequisite reading for any serious woodworker, pro or hobbist. The chapter "Coping with Wood Movement," very clearly demonstrates the cupping of flat–sawn wood towards the bark side as the water content is reduced. However, the chapter "Water and Wood" also shows that a cupped board that is allowed to reabsorb moisture moves back beyond its original shape and cups in the opposite direction. Now, given a board left untreated, what is the proper grain polarity for decking?

The new book, *Understanding Wood Finishing* by Bob Flexner also addresses this issue. He states, "...cupping is always on the top side of boards, even though the direction of the rings would often indicate the opposite should happen..."

Whatever the grain direction of decking, if treated on the top surface only and not on the underside, all boards will cup up.

I think that grain polarity is not the only issue to be addressed when installing flat–sawn decking. What materials will be used and how the boards will be moisture protected is probably the primary concern.

Ron R. Rodewald
Cary, Illinois

An Axe to Grind

In response to your letter from Mr. William Nichols in the March 1994 issue, I have to make strong exception to his comments on the use of an axe.

I also own several chain saws, but there are times in cutting and limbing trees that an axe is indispensible, and far safer than a chain saw if used and kept properly sharpened.

John Remmers
Balsam Lake, Wisconsin

Happy Little Men

Herman Hoffman, form Michigan Center, MI made Howard French's Mighty Mite Excavator from cherry for his grandson, Joe Kurzynowski (above). Joe spent Christmas Day digging up Grandma's living room.

Jim Raevis, a frequent contributor (see page 67), built the Mighty Mite for his children. One of the pictures Jim sent was too dark to publish, but it shows one of his sons using the Mighty Mite to excavate snow on the patio. Smart move, Jim.

Band Saw Help!

I need some help in finding some parts for my band saw. It's a Central Machinery, 14" wood cutting band saw, Model 725. The company that made it is no longer in business and parts are no longer available. I need several parts including 3, Part No. B12 wheel tyre and several blade guide parts—B33, B34, B40 and B41. I would appreciate any help you can give in finding a source for these parts.

James Martin
Plymouth, California

The Log Ladder

We received several responses to Eugene Studer's letter (PW 77) about the log ladder he saw at Thomas Edison's home. Two sources were given.

Plans and instructions can be found in The Woodwright's Eclectic Workshop *by Roy Underhill. He calls it a "Jefferson Ladder" because the design is attributed to Mr. Jefferson.*

The other comes from Eric Sloane's Diary of an Early American Boy, *© 1965. One caller informed me that his local library contained a copy of the book. Mr. Sloane explains that the early settlers left the door to their windowless cabins open at night to ventilate the fireplace. They slept in the loft because it was warmer and pulled the ladder up after them for protection from "Indians and wild animals."*

—The Editors

Laundry Hamper Correction

For my Laundry Hamper, featured in PW 77 (March, 1994), please correct Part K, the back rails width to read 3½".

Bob Colpetzer
Clinton, TN

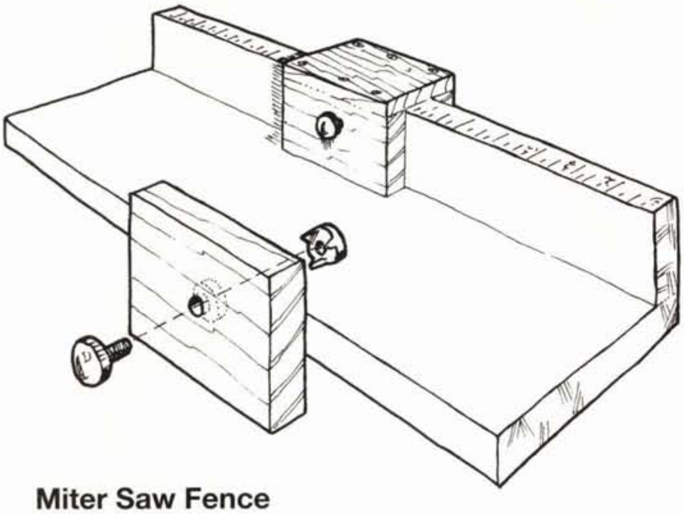
Too Late For Our Calendar

Richmond Carvers Society
5th Annual Woodcarving Show
June 3, 4 and 5th
Steveston Community Centre
4111 Muncton Street
Steveston, B.C.

Contact: Graham Townsend, 4849 Central Ave., Delta, B.C. Canada V4K 2G5. Tel. 604 946-8298.

Tricks of the Trade

Tricks of the Trade shares readers tips for making woodworking tasks easier and safer. Send your original, unpublished ideas to Tricks of the Trade, % Popular Woodworking, 1041 Shary Circle, Concord, CA 94518. We pay $25 for each TOT we publish.



Miter Saw Fence

If you have an extension fence on the power miter saw in your shop, then this trick will appeal to you. I've seen some fence stops that are pretty elaborate and time consuming to make. I came up with my own simplified fence stop and measuring system that works quite well.

I bought a length of self–stick mylar tape measure that reads right to left and installed it on the top of the miter saw fence. The tape measure does not start at zero because of the length between the beginning of the extension fence and the saw blade. You will need to get an accurate measure of this length and install the measuring tape accordingly.

Next, make a simple stop to slide along the top of the fence. The height and width of the fence stop will depend on the size and thickness of your fence. Use a ¼" threaded knob and tee nut, or larger combination. Cut three pieces to size and counter bore the back side of the front piece. Counter bore deep enough to seat the tee nut flush on the back side, a Forstner bit works well for this. From the front drill a through hole in the center of the counterbored hole the same diameter as the sleeve on the tee nut. To operate this adjustable stop block just slide it along the top of the fence to the desired dimension on the tape and turn the knob to tighten the screw on the fence. The end of the threaded knob puts pressure against the fence to hold it in place. Only light pressure is needed. I made the fence stop out of maple for durability and stability.

Robert DiTucci
Wayne, New Jersey

Notched Magnet Holds Nails

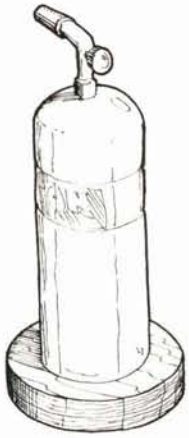
Here's a trick that a neighborly do–it–yourselfer showed me: Using a triangle file, put a notch in a piece of *magnetic* strip. Nails or brads pressed into the notch remain straight and on target until started into the wood. The strip also acts as a protective pad that will prevent marring if your hammer strays from its intended mark. When finished, pop the magnet nail holder against the inside top of your toolbox, or on the head of your hammer. It will stay there until you need it again.

Lane Olinghouse
Everett, Washington

Filling Small Gaps

I've heard many times that it's a good idea to keep a little sawdust from each project you make. If the project is damaged in the future and needs wood filler, there is nothing better than making your own from the original sawdust. Mixing sawdust with glue works well for filling small imperfections and gaps. Recently I mixed sawdust with varnish and the results were even better. First, finish the piece with one coat of varnish or polyurethane and then, before sanding between coats, mix up a little paste with the sawdust and finish. Use it to fill any gaps then fine sand or steel wool before adding your second coat of finish.

Bill Buckwelder
Horseheads, NY



Wooden Base Holds Torch

Cut a 9" diameter disk from scrap 2 x 10; then, cut out a 3" diameter hole in the center of the disk to hold the torch. This base is great for holding the torch safely for assorted jobs.

Howard Moody
Upper Jay, New York

Keep Knobs from Turning

If you are building a chest of drawers and using round wooden drawer pulls, here's how to keep the knobs from turning off the retaining screw. First, turn the screws into the knobs as usual, then drive a tiny nail through the drawer panel from the inside, so it enters the knob about ¼". The knob won't turn off the screw. If the drawer front is hard wood, drill a pilot hole for the nail. You can also use small wood screws so they may be removed at a later date.

Lane Olinghouse
Everett, Washington

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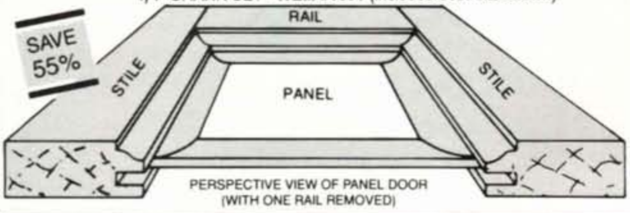
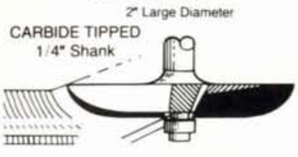


PERSPECTIVE VIEW OF PANEL DOOR (WITH ONE RAIL REMOVED)

RAISED PANEL BIT
SUPPLIED WITH
BALL BEARING



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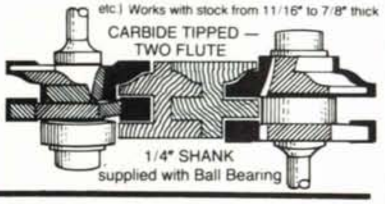

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#1308	CLASSICAL - 3/16" Radius — 5/8" Cutting Length	1/2"	$22.50
#1309	45° CHAMFER - 3/8" Cutting Length	1/4"	$13.00
#1310	45° CHAMFER - 5/8" Cutting Length **NEW !**	1/4"	$15.00
#1311	45° CHAMFER - 5/8" Cutting Length	1/2"	$17.00
#1312	THUMBNAIL - 1- 3/16" Large Diameter	1/4"	$18.50
#1313	THUMBNAIL - 2-1/2" Large Diameter	1/2"	$35.00
#1314	ROUND OVER - 1/8" Radius	1/4"	$11.00
#1315	ROUND OVER - 3/16" Radius	1/4"	$11.00
#1316	ROUND OVER - 5/16" Radius	1/4"	$14.00
#1317	ROUND OVER - 1/4" Radius **NEW !**	1/2"	$12.00
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#1324	RABBETING - 1/4" Deep	1/4"	$15.00
#1325	RABBETING - 3/8" Deep **NEW !**	1/4"	$13.00
#1326	RABBETING - 3/8" Deep	1/2"	$13.00
#1327	CORE BOX - 3/8" Large Diameter	1/4"	$11.00
#1328	CORE BOX - 1/2" Large Diameter	1/4"	$13.00
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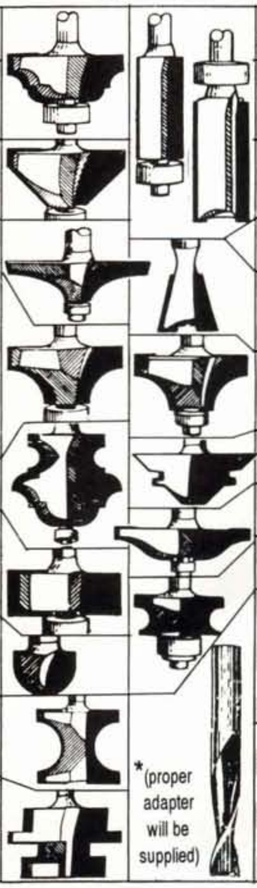
#1336	TONGUE & GROOVE - Wedge	1/2"	$29.00



*(proper adapter will be supplied)

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#1339	FLUSH TRIM - 1/2" Diameter — 1-3/16" Cut.Length	1/2"	$ 8.00
#1340	PATTERN / FLUSH TRIM - 1/2" Diameter	1/4"	$15.00
#1341	PATTERN / FLUSH TRIM - 3/4" Diameter **NEW !**	1/4"	$17.00
#1342	PATTERN / FLUSH TRIM - 3/4" Diameter	1/2"	$19.00
#1343	KEYHOLE CUTTER - 3/8" (bit not	1/4"	$ 8.50
#1344	KEYHOLE CUTTER - 1/2" shown)	1/4"	$ 9.00
#1345	DOVETAIL (HSS) - 1/4" Diameter — 7-1/2°	1/4"	$ 6.50
#1346	DOVETAIL - 1/2" Diameter — 14° **NEW !**	1/4"	$ 6.00
#1347	DOVETAIL - 1/2" Diameter — 14°	1/2"	$ 6.50
#1348	BEADING - 1/4" Radius	1/4"	$13.00
#1349	BEADING - 3/8" Radius	1/4"	$15.50
#1350	BEADING - 1/2" Radius	1/4"	$17.00
#1351	LOCKMITRE - 7/8" Cutting Length **NEW !**	1/4"	$32.00
#1352	LOCKMITRE - 1-1/8" Cutting Length	1/2"	$45.00
#1353	OGEE RAISED PANEL - 2" Large Diameter	1/4"	$28.00
#1354	OGEE RAISED PANEL - 2-3/4" Large Diameter	1/2"	$32.95
#1355	EDGE BEADING - 3/16" Diameter of Circle	1/4"	$15.00
#1356	EDGE BEADING - 5/16" Diameter of Circle	1/4"	$15.50
#1357	SPIRAL UPCUT - 1/8" Diameter (solid carbide)	1/4"*	$ 9.00
#1358	SPIRAL UPCUT - 1/4" Diameter (solid carbide)	1/4"	$12.00
#1359	SPIRAL UPCUT - 1/4" Diameter (solid carbide)	1/2"*	$12.00
#1360	SPIRAL UPCUT - 3/8" Diameter (solid carbide)	1/2"*	$24.00
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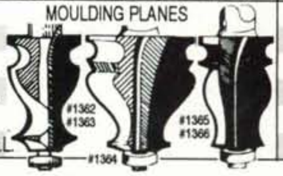
	MOULDING PLANES 		
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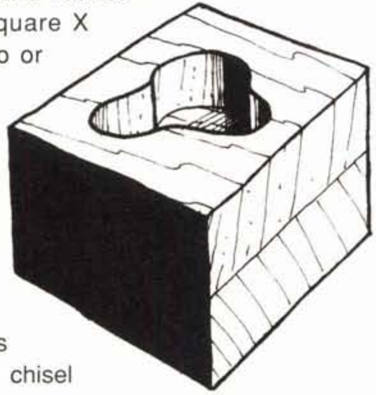
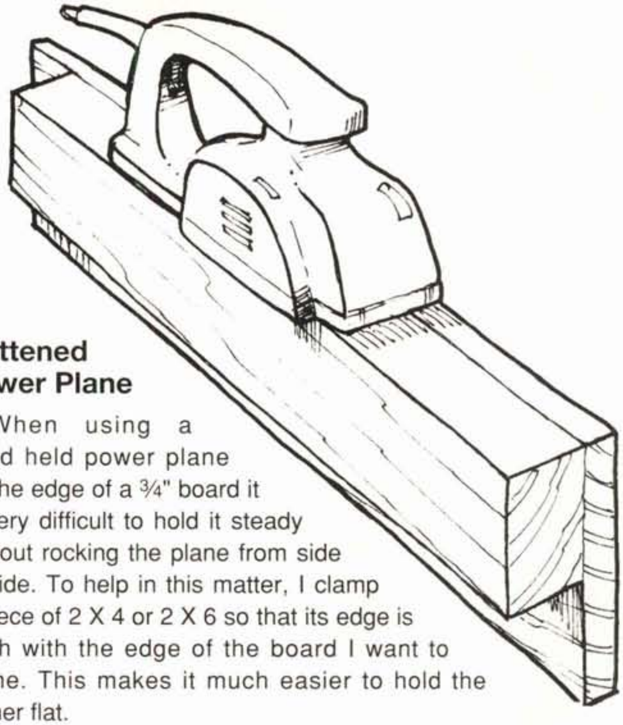
When tilting my scroll saw table I find that the knob is too small for me to get a good grip. Sometimes I can't turn it at all and need a wrench to loosen it. I solved this problem with a 2" square X 1½" hardwood block. Two or more pieces of wood can be glued together to make this thickness. Locate the center of the block and trace the knob profile on the center of the wood. Using a Forstner bit, drill three holes ½" deep at the points of the profile. Use a wood chisel to relieve the rest of the area marked for the profile. Test fit the knob in the block of wood, you want a loose fit, but not so loose that the block slips off when tightening the knob. When you need to tilt the scroll saw table, just place the wooden handle over the knob and turn. For a custom fit, carve the block to fit your hand.



John R. Todd Sr.
Holly Springs, North Carolina



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When using a hand held power plane on the edge of a ¾" board it is very difficult to hold it steady without rocking the plane from side to side. To help in this matter, I clamp a piece of 2 X 4 or 2 X 6 so that its edge is flush with the edge of the board I want to plane. This makes it much easier to hold the planer flat.

David F. Black
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Here's How to Turn Your Woodworking Skills into Cash!

"My woodshop makes me $300 a week, part time. Your's can, too!"

by Rick Gundaker

You've heard of "the woodworker who was a real butcher." It's true, for many years I *was* a meat cutter in a butcher shop in Erie, Pennsylvania. But several years ago the poor economy in the Erie area forced me to look for a new job.

After four months, I found a new job, but it paid less and had fewer benefits. I desperately needed a second income.

I was sitting at the kitchen table very late one snowy night in December. I couldn't sleep, my checkbook was overdrawn, bills were piling up and the bank was threatening to foreclose on our home. Then it came to me.

For many years I had been making woodcrafts. I had made many unique items for our home. Everybody raved about them, so I started making them for gifts. My wife, Amy, said, "Rick, you should start selling your woodcrafts." But I just laughed. Well, I wasn't laughing that night. Maybe Amy was right. Maybe I could sell them!

I took what little money we had, borrowed some from my Mom, and turned to my hobby with serious determination.

When I first started, my income was small. But time and experience helped me develop a successful selling method. Plus, I designed many easy-to-make, fast-selling woodcrafts. My income grew beyond my greatest dreams.

Today, Amy and I live in a nice country home on ten acres of land and it's paid for! That's a great feeling, but the best feeling of all is the self satisfaction I have of being able to make the extra money I need whenever I need it.

You, too can make the extra money you need while enjoying your hobby. Using your basic woodworking and painting skills, you can create great gifts and turn your woodshop into a part-time money maker. I know it can be done because I did it, and I've helped many other woodworkers make money part time, too!

The following are excerpts from letters I've received from woodcrafters I've helped.

"You sure know what sells! The items I made from your plans have been on display at the local bank in St. Joseph. In less than 30 days I have sold ***$1,700*** *of my woodcrafts!! I'm enclosing a news story our local paper did on my work."*

W.F.H. of St. Joseph, MN

"My wife is a school teacher. I made her one of your cute designs to set on her desk. Other teachers saw it and and she sold eleven of them before the day was over. Keep up the good work."

C.M. of Baltimore, MD

"You're doing good. I've made several of your plans and the response to buy has been great. Every year I sell my crafts at our church fair and donate all the proceeds to the church. In 3 days I made over $600!"

C.R. of Chalmelle, LA

"Your patterns are simple and very easy to follow. I'm fairly new to woodworking and it's great to see full-size patterns with enough information so that even a beginner with limited woodworking knowledge can complete a project on their own. I'm really having fun with woodworking. Thanks for sharing your knowledge and experience, it's invaluable to the novice."

C.L. of Houston, TX

If these woodworkers can do it, you can, too!

This isn't some kind of "Get Rich Quick" deal. No way. There's *plenty* of room for *everyone* in crafting. I won't be competing with you and you won't be competing with me. That's why Amy and I would enjoy showing you how you can start your own craft business using your basic woodworking and painting skills. You can go as far as you want... *profits are virtually unlimited!*

HERE IS WHAT I'LL SEND YOU

I've put all my successful methods, plus 35 of my fastest selling designs, with step-by-step instructions into one fact-filled guide.

I'll show you...

- How to begin with a small amount of money.
- What tools you will need. I'll give you an exact list.
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- What type of lumber and hardware to use and where to buy it.
- How to give your crafts that personal touch that will increase sales by 80%.
- How to find and choose the right shows.
- How to set up books and records.
- How to avoid the mistakes that I made... and save hundreds of dollars.
- **PLUS...** I'll send you THIRTY-FIVE of my show-tested, fast selling woodcrafts in easy-to-copy *full size* plans, with actual photographs of each finished item.
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Start turning your woodworking shop into a money maker today! I'll send you my complete guide to examine for 31 days. A full month! There is absolutely no risk to you. NONE.

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Book Reviews

by Hugh Foster

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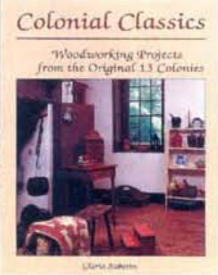
★ ★ ★ ★ ★ ★

Colonial Classics: Woodworking Projects from the Original 13 Colonies by Gloria Saberlin; TAB Books, Blue Ridge Summit, PA 17294; 124 pages, paperback, $14.95.



Clearly illustrated with photos and line drawings, this volume presents seventeen projects in Early American style. While the projects are not terribly difficult to build, the clear illustrations will make completing them far easier. It appears that all you'll need to add are the materials and patient crafting. The detail drawings are grided to make reproducing their actual size seemingly effortless. Even so, full–size patterns become more attractive when trying to enlarge even the clearest scaled drawing.

One of the beauties of the book is that the projects are all identified by source. As you build these projects, you will be copying real antiques rather than just working in the style of our forebears.

This attractive volume presents utility projects, some furniture, and my favorite, a crook stand. It is well worth your attention.

Children's Furniture You Can Make by Paul Gerhards; Stackpole Books, 5067 Ritter Rd, Mechanicsburg, PA 17055; 126 pages, paperback, $14.95.

Children's Furniture
You Can Make
Paul Gerhards
Bunks & Bureaus, Toy Chests & High Chairs, Cradles & Computer Tables

The book is subtitled, "Complete Plans and Instructions for Bunks and Bureaus, Toy Chests & High Chairs, Cradles and Computer Tables." In all, there are sixteen projects, none of which are terribly intimidating. These are handsome projects, readily adaptable to whatever style you and your child prefer. The projects are well drawn and photography is good. The joinery used in the projects is all doable, even in a novice woodworker's shop. The only questionable thing about the book is the word "Children's" in the title—I know many adults who would be thrilled to have furniture of this style, function and quality. One of the most noteworthy projects in the book is the high chair. It's meant for youngsters who have graduated from the high chair's tray to eating at the table. It's an appealing design, far superior to propping your kids up on a Sears catalog.

The Encyclopedia of Woodworking Techniques by Jeremy Broun; Running Press Book Publishers, 125 South Twenty-second Street, Philadelphia, PA 19103; 176 pages, hard cover, $24.95.

This impressive full–color book covers the basics of how to use most common, and many uncommon, woodworking tools. The instructions are clear, if not a bit elementary. I found many of them to be familiar, yet there were some that corrected years of misuse and misunderstanding in my own shop. I recommend reading this book by beginning with the project section on page 128. With almost every turn of the page the reader is greeted with a beautiful piece that evokes a gasp of awe and appreciation.

While the book does not present project plans, it does inspire the use of less conventional designs and methods for using tools and making them work for us. While the tool instructions are decidedly British in flavor, the projects are international—all 70 projects are breath–taking. This book is a handsome and helpful addition to any bookshelf.

***Hugh Foster** is an English–teaching woodworker and author from Manitowoc, Wisconsin.*

Finishing Forum

by Tom Wisshack

The Finishing Forum is an ongoing discussion about the art of wood finishing. If you have a question or a problem to solve, we'd like to help. If you have a tip or secret to share, or you recently tried a new product, write to: The Finishing Forum c/o *PW*, 1041 Shary Circle, Concord, CA 94518. Letters may be edited.

Making Stains

I have been trying to stain the light sapwood of a piece of walnut to match the darker heartwood. The light wood doesn't absorb stain or oil. Can you suggest a process that might help?

R.W Johnson
Leroy, Michigan

You'll probably need a more concentrated stain to match the walnut sapwood and heartwood. Try one of the gel stains manufactured by the Bartley Collection (800-BARTLEY). If this doesn't, work I suggest making your own stain. Mix artists' oil colors with turpentine and a few drops of Japan drier. The advantage with this method is you can come up with the perfect shade by intermixing the oil colors. Start with burnt umber and add small amounts of black, burnt sienna or red to match the wood tone.

Getting Started

There seem to be an infinite number of ways to finish a project. For a novice like myself this is very frustrating. Can you recommend a book that offers several good finishing methods for the beginning woodworker?

Cathi Block
Portland, Oregon

I'm sure that a lot of woodworkers are bewildered by the number of finishes and finishing techniques available today. I recommend a book called Finishing–Techniques for Better Woodworking *(Rodale Press). The information is laid out in a logical way and structured for the beginner. If you wish to delve further into the subject, the books and videos by Michael Dresdner are quite informative (The Taunton Press).*

Here's some insight into the field of woodfinishing. Commercial products reflect current trends—once a particular product becomes popular, most companies market their own version. This can be very confusing. Remember that the best finishing products—shellac, tung oil, varnish, etc.—have been around for hundreds of years. They've been proven over time and continue to give good results. The secret to good finishing lies in the skill of the person applying the finish. This takes patience, an open mind and creativity.

Tom Wisshack *makes and restores fine furniture in Galesburg, Illinois.*

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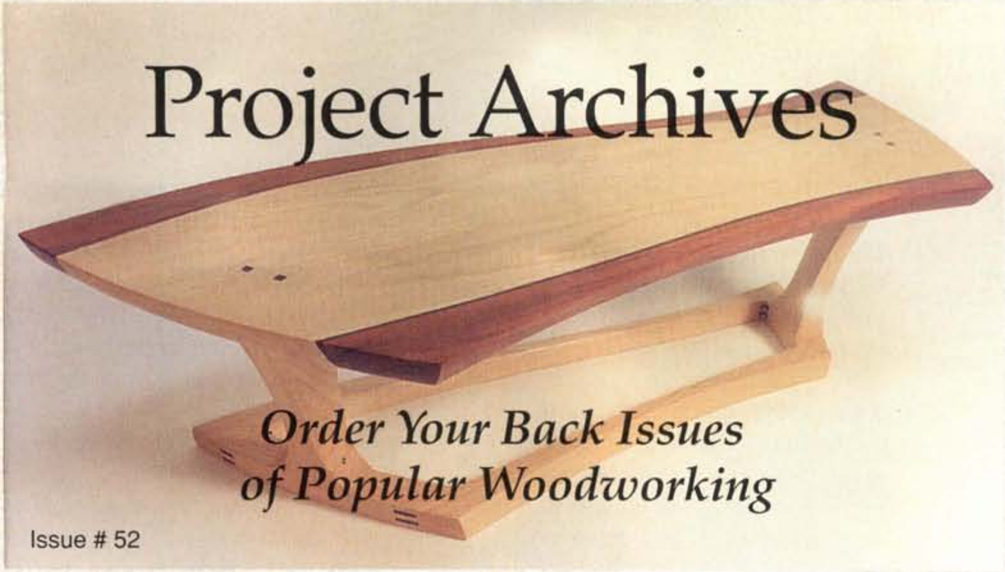

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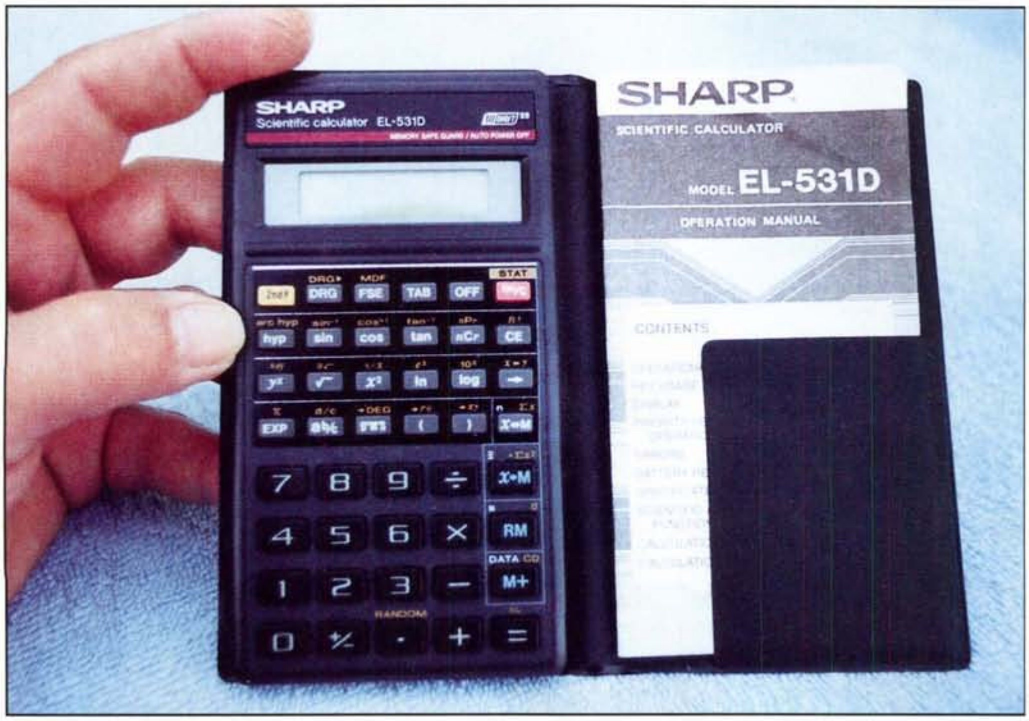


by Robert Calvert

Let me start off by saying I'm no whiz at mathematics—I learned the hard way. Over some 40 years of tool design work, when I didn't know how to solve a problem I dug out a textbook and plowed ahead. In the very beginning, basic trigonometric functions were a necessity. In those days we didn't have handy shirt pocket calculators and did it by simple arithmetic functions (+, −, x, and ÷). These simple functions in conjunction with the natural trigonometric functions tables were indeed a powerful tool. We will discuss the trig functions tables in a later part of this series. This will be to better understand how the simple formulas work; not because they're necessary with the advent of the scientific calculator. It will also help you use your calculator and double as a checking device for possible entry errors.

***Bob Calvert** is a retired tool designer and frequent contributor to* Popular Woodworking.

This five part series will, by necessity, be condensed, but I'll strive to present it in a logical, easy–to–understand manner. Most importantly, it will be focused on common woodworking problems. Many topics will be touched on, such as measuring devices, the best beam compass, conversion of degrees to decimal, properties of the circle (a wealth of information), learning simple trig and other handy formulas. Additionally the decimal system is covered because it's the method a calculator understands. We'll start with the decimal measuring system and an inexpensive scientific calculator.

We all know fractions are used with many different units of measure, but they're cumbersome to use with a calculator. There are special calculators that work fractions but they're a bit pricey at around $45. My $10 calculator has a special key (ab/c) which works fractions, so I haven't found a need for the higher priced unit. In my shop, I use a steel tape to measure for a project. But when it comes time to calculate some dimension, I see that fraction in my mind as a decimal. This stems from using this system for so many years in the engineering field. I have memorized all the 1/4, 1/8, 1/16, and 1/32's. Sometimes I forget some of the 1/64's but since 1/64 = .015, it's easy to just add or subtract it mentally.

Let me say right now for all the metric fans out there that no one system is any better than another, they're just different. For the purpose of this article we'll use the decimal system because it's the American industry standard. The decimal system is simply any given unit divided by 10. It is a system based on the number 10. You can have tenths of an inch, foot, yard, mile and so forth. The most common use is your car's odometer—each cylinder to the left is 10 times the preceding one. For this article we will deal strictly with the inch unit of measure.

The first number to the right of the decimal point is tenths of an inch. If two numbers are present, it's expressed as hundreds of an inch and three numbers is thousandths of an inch. The numbers go on, but for woodworking purposes this division is more than adequate. The most common place you hear this is the weather report for rain fall totals—three tenths (.3) or a little more expressed as 32 hundreds (.32).

So you need to know the decimal equivalent of a given fraction. The most useful method is a decimal equivalent chart. This one is a small chart showing only the fraction / decimal conversion but other large charts are available from tool supply houses. They are often free with advertisement on them. Often, they're large enough to read from across the room and many have metric conversions as well.

To convert any given measurement in fractions you simply write it down in decimals. Let's say you are measuring an object that's 5" and a bit more than 9/16". A close look shows it half way between 9/16" and 5/8". The chart shows that 19/32" is your true measurement. That number according to the chart is .59375 so your total conversion is written 5.59375 which can be rounded off to 5.594. If you're doing a rather long calculation, it's best to use the complete number and only round off the final answer. This lessens the accumulative error effect.

You may be saying to yourself, "why use such close measurements for woodworking?" The answer has to do with the machines themselves. They generally have poor setting tolerances and if you know exactly what the dimension needs to be, you'll spend about half the trial and error time. Besides, the calculator does all the work.

A word about scientific calculators: If you don't have one, please do yourself a favor and get one. When they first were introduced the price was prohibitive at $600 each. Now with mass production, this type of unit can be purchased for under $20. I bought a Sharp Model EL-531D on sale for under $10 about 2 years ago. This is a super calculator that fits in a shirt pocket and has many features. The ab/c key enters fractions, allowing you to add, subtract and so forth. The 2ndF key converts the ab/c to the d/c mode which converts fractions to decimals, thus eliminating the need for a decimal equivalent chart. The DMS key makes conversion of degrees to decimals a snap. It of course has all the necessary buttons to enter the higher math functions and it's easy to punch in values with a large key pad.

At the time of this writing, I checked the stores for my model calculator as shown in the photo. It wasn't there, but three newer models were. The EL-531GB at $12.97, the EL-521GB at $14.97 and the EL506GB at $17.97 all were slightly larger than my D model. The 531GB looked most like mine—the 521GB has solar power. For my money, the 506GB was too confusing to read and had too many features. It did have one saving grace in a larger display that's easier to read. All three have the same keys, but in slightly different locations. I priced these at a local drug store and none were on sale.

In future parts I'll refer to my calculator for many of the formula calculations. It uses the algebraic entry system where the values are entered just as you would say it or as it's written in a formula. I.E.: 3 X 5 = 15. If you can't find one of the above models, try punching in a sample problem like the one shown. I find this entry system easiest to use. All of the above calculators mentioned use this system.

In the next segment I'll talk about measuring instruments—good, better and best. Also, where to buy the best beam compass at a very economical price and I'll give several drafting tips. PW

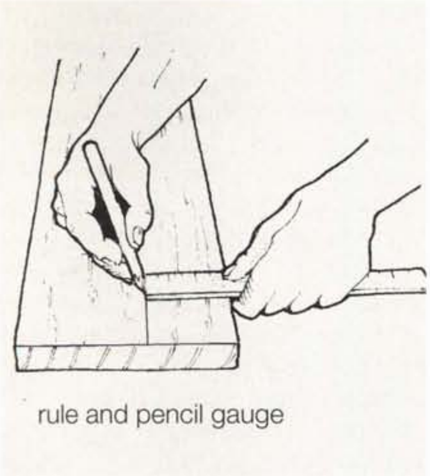
Inch/Millimeter Conversion Table (Multiply Inches × 25.4 = Millimeters)

Inches		Millimeters	Inches		Millimeters	Inches		Millimeters
Fractions	Decimals	Decimals	Fractions	Decimals	Decimals	Fractions	Decimals	Decimals
1/64	.016	.397	25/64	.391	9.922	49/64	.766	19.447
1/32	.031	.794	13/32	.406	10.319	25/32	.781	19.844
3/64	.047	1.191	27/64	.422	10.716	51/64	.797	20.241
1/16	.063	1.588	7/16	.438	11.113	13/16	.813	20.638
5/64	.078	1.984	29/64	.453	11.509	53/64	.828	21.034
3/32	.094	2.381	15/32	.469	11.906	27/32	.844	21.431
7/64	.109	2.778	31/64	.484	12.303	55/64	.859	21.828
1/8	.125	3.175	1/2	.500	12.700	7/8	.875	22.225
9/64	.141	3.572	33/64	.516	13.097	57/64	.891	22.622
5/32	.156	3.969	17/32	.531	13.494	29/32	.906	23.019
11/64	.172	4.366	35/64	.547	13.891	59/64	.922	23.416
3/16	.188	4.763	9/16	.563	14.288	15/16	.938	23.813
13/64	.203	5.159	37/64	.578	14.684	61/64	.953	24.209
7/32	.219	5.556	19/32	.594	15.081	31/32	.969	24.606
15/64	.234	5.953	39/64	.609	15.478	63/64	.984	25.003
1/4	.250	6.350	5/8	.625	15.875	1	1.000	25.400
17/64	.266	6.747	41/64	.641	16.272			
9/32	.281	7.144	21/32	.656	16.669			
19/64	.297	7.541	43/64	.672	17.066			
5/16	.313	7.938	11/16	.688	17.463			
21/64	.328	8.334	45/64	.703	17.859			
11/32	.344	8.731	23/32	.719	18.256			
23/64	.359	9.128	47/64	.734	18.653			
3/8	.375	9.525	3/4	.750	19.050			

Gauges Galore

For marking, cutting and splitting

'Gauge' is a curious word, whose origins are thought to have something to do with a medieval French wine container used as a standard for quantity. Although the spelling 'gage' is for most uses now more common, when referring to the various woodworking tools that are used for measuring and layout the word is usually spelled 'gauge'.



rule and pencil gauge

Gauges constitute a surprisingly extensive family of tools. Their size may range from small to large, and their manufacture from simple, shop–made devices to sophisticated, factory–made models. Almost every woodworker is familiar with—and probably owns—the common marking gauge, but how many are on working terms with (amongst many others) the panel gauge, the slitting gauge, or the butt–and–mortise gauge?

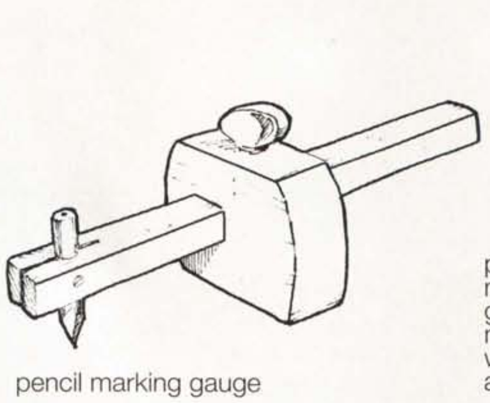
The Simplest Marking Tool

Although 'gauge' means simply to measure, the woodworking gauge usually does something more: it marks. It may do this lightly or in a more permanent fashion. The simplest gauge is the hand itself. Holding a pencil between thumb and forefinger, and running the hand down the edge of a board with the little finger hooked over the edge, a surprisingly straight and accurate line can be drawn up to as much as five or six inches from the edge. By using a graduated rule with the hand that holds it as a fence pressed against the edge of a workpiece, an even straighter and more precise line can be drawn with the aid of a pencil held against the end of the rule. Substitute a wooden stock for the hand that holds the rule, make it adjustable and securable by means of a thumbscrew, and fix the pencil in the end of the rule or stem with a screw, and you will have made a simple pencil marking gauge. The common, factory–made marking gauge—fitted with a steel point instead of a pencil—is essentially the same tool. Even a metal tape measure can be used as a marking gauge: the hook at the end of the tape, usually used to hook over the end of a workpiece, is often made with a hole or notch in it that will securely locate a pencil point. Use a pencil with the tape measure as you would to the rule and pencil; the locking device found on many tapes further increases the accuracy of any line drawn this way.

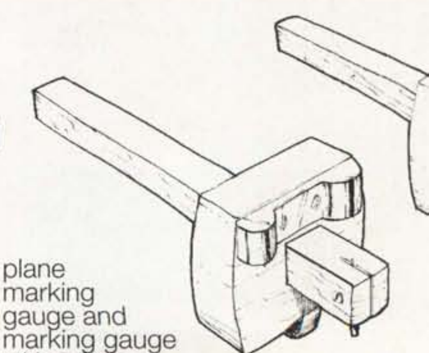
The Basic Marking Gauge

The standard factory–made marking gauge looks deceptively simple, but can be surprisingly sophisticated. Apart from often being made from exotic materials, such as ebony and rosewood, it may have a brass–faced stock (to withstand wear better); it may have a reversible stock, one side of which may be flat and the other fitted with a shaped fence (or two simple protrusions) that allows the fence to be run around curved surfaces; the stem may be variously graduated and itself be reversible, one end holding a pencil and the other a pin.

There is more to the pin than may at first meet the eye. For a truly precise gauge, especially one with a graduated stem, the point of the pin should be exactly aligned at 'zero'. It must also be sharp, for a blunt pin will not be able to measure any better than a sixteenth, or even an eighth, of an inch. When sharpening the pin, therefore, file only on the outside of the pin, leaving the inside flat. As commonly sold the pins invariably project too far. If it cannot be adjusted (usually by loosening the screw that secures it in the stem in better models or simply by tapping it back

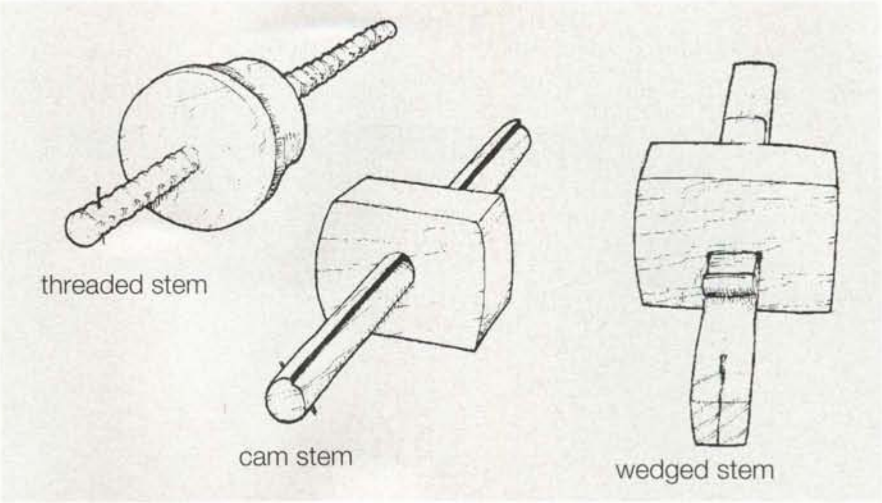


pencil marking gauge

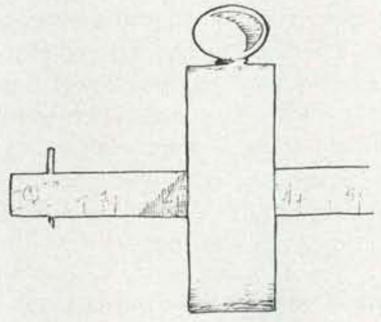


plane marking gauge and marking gauge with a fence adapted forfollowing curved work.

***Graham Blackburn** makes furniture and writes about woodworking in Inverness, California.*

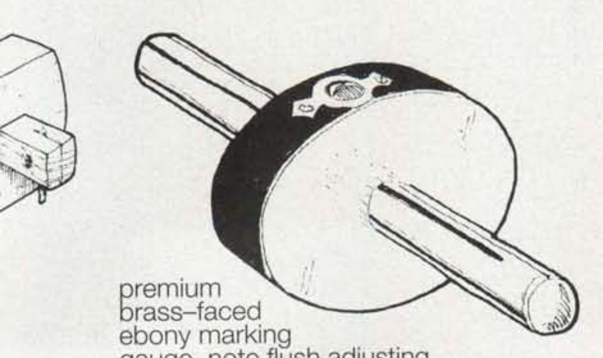


in cheaper models) file it to within a quarter of an inch. A long pin makes it harder to maintain the correct angle when running the gauge; a short pin allows the gauge to be held more closely and squarely to the work.



correct profile of marking gauge pin, note bevel and depth.

The superior control afforded by a shorter pin is one reason why a round–stemmed gauge is better than a square–stemmed gauge. To prevent the pin jumping out of its prescribed course the pin must be tilted in use (whether being pushed or pulled along the work). This requires a longer pin with a square stem—in order to accommodate the corner of the square stem. Round–stemmed gauges, however, are usually more expensive. This is not because it's cheaper to make a square hole in the stock than a round hole, but because a round stem requires a keyway to keep it aligned in the stock.



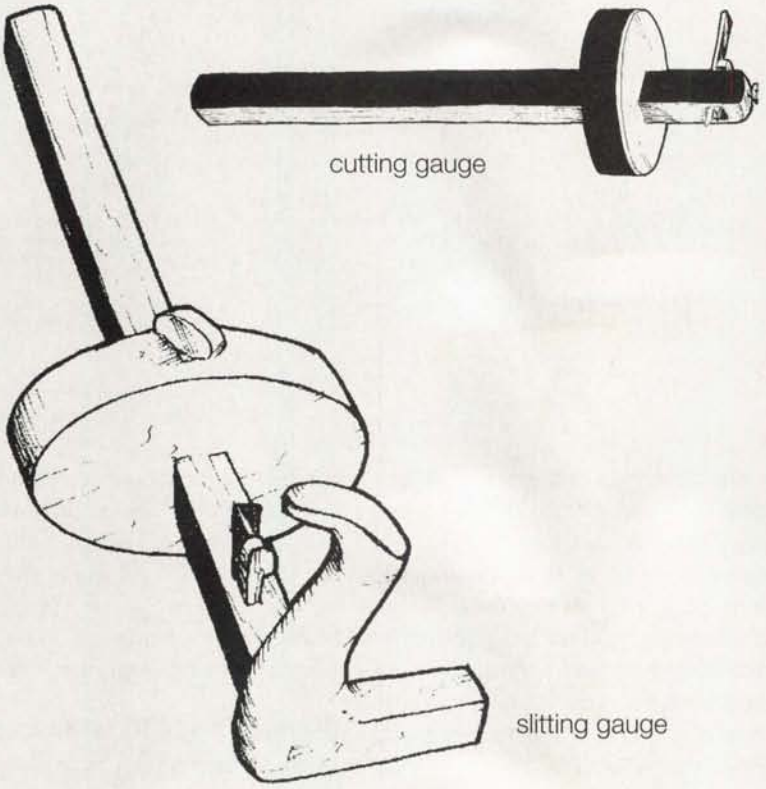
premium
brass–faced
ebony marking
gauge, note flush adjusting
screw and stem keyway.

Nineteenth–century cabinetmakers enjoyed the luxury of premium marking gauges made entirely of ebony and brass and fitted with flush adjustment screws. These offered the advantage that, once having been set to a required measurement, it was then almost impossible to alter the setting inadvertently—as might happen with a gauge adjusted by thumbscrews that were not only liable to being knocked loose but also of being inconveniently placed and requiring that the gauge be used only in certain directions.

The are other ways of securing the stock on the stem. If you own a thread–cutting device—either a router–operated type or the traditional screwbox and tap—the stem may be threaded and the stock made of two tapped parts, the larger holding the pin and the smaller working as a locking ring. The cam–set gauge is particularly ingenious in that it requires no screw at all. The wedged stock is also simple but can work loose with annoying frequency. The usual thumbscrewed version can be improved by mortising the inside face of the stock at the point where the thumbscrew emerges to bear against the stem—with ultimately deleterious results to the stem—and fitting a small brass plate that protects the stem and affords a greater bearing surface.

Cutting and Slitting Gauges

By replacing the pin or pencil with a knife a whole new class of gauge is created—one that is capable not only of marking and layout but of actually scoring or cutting the work. A cutting gauge is typically somewhat larger than a marking gauge, and is used where the marks required for layout coincide with future cuts—made by chisel or saw. It can therefore be an ideal marking tool. When laying out dovetails, for example, the groove left by the knife edge forms a failsafe starting location for the chisel for cleaning out the final joint. When marking rabbets, grooves, or dadoes to be planed, the cutting gauge will sever the fibers cleanly, especially across the grain, allowing a clean edge to be worked. Like the pin on a marking gauge, however, it is important that the knife edge be properly sharpened. It should have a single bevel, the inside of the knife being perfectly flat. This makes possible accurate gauging as measured from the inside of the stock, and takes advantage of the bevel to keep the stock close to the edge of the workpiece; when the bevel is on the inside there is a tendency for the cut-



ting edge, especially when it encounters pronounced grain, to be forced closer to the edge, in turn forcing the stock away from the edge of the workpiece and so producing an inaccurate line. But note that when using the cutting gauge for laying out dovetails, as mentioned above, the knife should be reversed so that the beveled side enters the work on the waste side of the line.

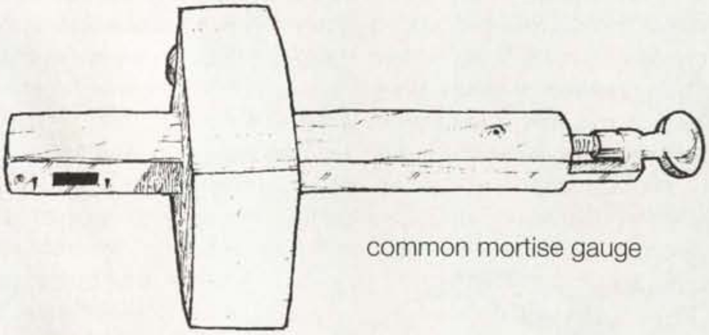
In addition to reversing the knife the shape of the actual cutting edge may be formed so that the gauge may be pushed or pulled (and worked in either direction when the blade is reversed). As with the pin on a marking gauge, set the knife so that the smallest amount of blade that is practical protrudes through the stem; this will increase accuracy and give you greater control.

The big cousins of the cutting gauges are called slitting gauges. These often have a stem as long as eighteen inches or more, fitted with a commensurately beefy stock. The end of the stem housing the blade is usually fitted with a handle similar to the toat of a jack plane. This is not merely a convenience for a large and otherwise unwieldy gauge–type tool, but is a necessary requirement for a cutting edge that needs a certain amount of pressure to be applied over the blade. To facilitate forward movement while this pressure is being applied, better models are fitted with a small wheel or roller directly under the handle. Whether the roller bears on the work or the bench will depend on how wide the workpiece is, but if the waste is to be reused it is good practice to place a thin piece of scrap under the roller.

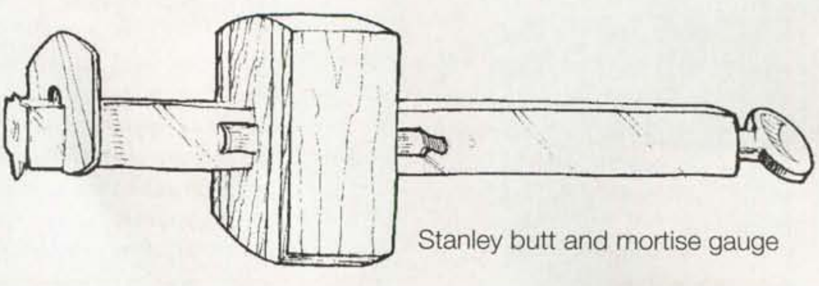
Slitting gauges are useful for cutting out thin boards, such as drawer bottoms and veneer, and may also be used to cut thin strips such as the stringing used in inlay and banding work. If the stock is first reduced to the proper thickness, and the stock or head of the slitting gauge adjusted to the width of one piece of stringing, repeated cuts can be made working from the same edge of the stock to produce as much length as is needed.

Large and Odd–Shaped Gauges

Panel gauges, particularly elegant but very simple tools, are a good example of how the common marking gauge may be easily adapted to unusual requirements. Used a lot by coachbuilders and wainwrights (waggonbuilders) in the last century and the



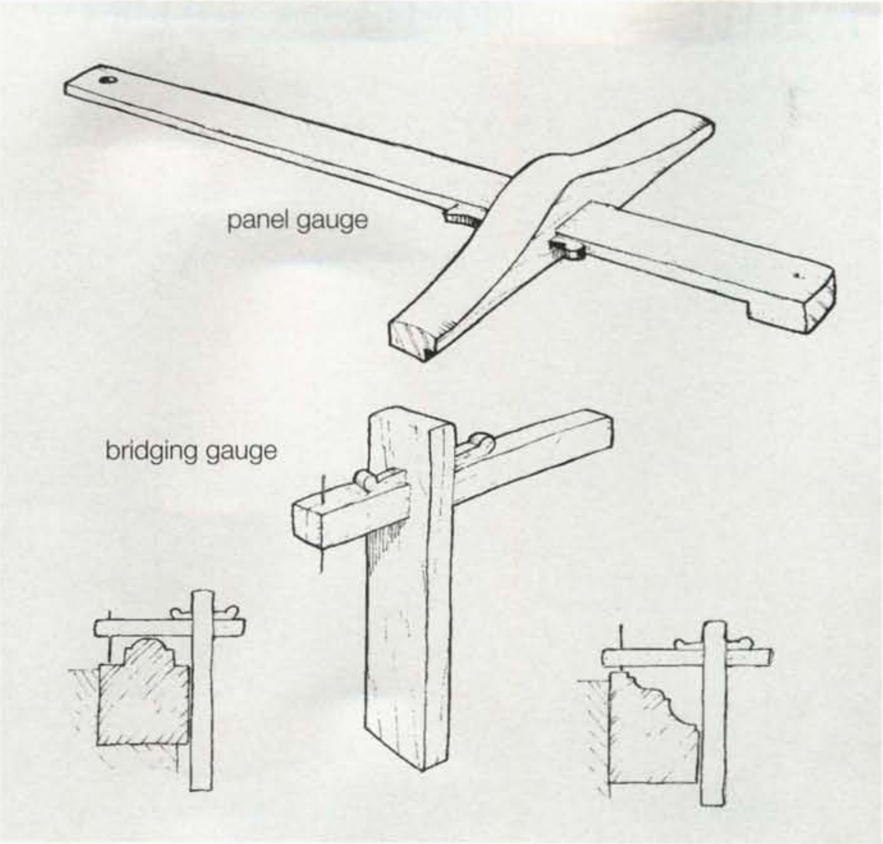
common mortise gauge



Stanley butt and mortise gauge

early years of the present century, panel gauges are nothing more than a long square stem wedged (or thumbscrewed) into a wide and often gracefully formed stock. The only refinement is a small rabbet sometimes formed on the lower inside edge of the stock that guides it more securely along the workpiece being gauged.

While panel gauges are ideal for marking large workpieces, or gauging lines far from an edge, there are many other situations where the work is not necessarily oversize but so constructed that a normal gauge is unusable. The bridging gauge is a typical example of this sort of tool. Its stock is extra deep, enabling it to be held against the workpiece at a point lower than the level at which the marking is to be effected, thereby making it possible to run the gauge over obstructions or mark a line on a surface that is not contiguous with the referenced face—such as a deeply moulded edge that effectively removes the corner. Wheelwrights, coopers, and carriagebuilders commonly furnished themselves with a variety of shop–made gauges for unusual situations, and the modern woodworker may profitably do the same once the principle is understood.



Double Gauges and Mortise Gauges

A much collected variety of marking gauge, owing to the many ingenious and often pleasing varieties made over the years, is the mortise gauge. A mortise gauge merely scribes two lines, parallel to each other, rather than one. It is used typically to lay out the sides of a mortise to be cut in a workpiece. A simple marking gauge will do the job just as well, but will, of course, need to be reset to scribe the second line. However, if there are many mortises to be laid out, all of the same size, or if one particular size mortise is most commonly used in your work, two marking gauges, each permanently set to one side or the other of the mortise are more convenient. Similarly, a marking gauge with two pins set in the stem, at the requisite distance apart, will save even more time. Many user–made mortise gauges are precisely of this sort. They possess the great virtue of being instantly ready and always correct.

A mortise gauge whose second pin is adjustable is a refinement useful only if you commonly need to lay out different size mortises. If you do, the choice of adjustment systems is staggering. The simplest is a user–made type common in shops around the turn of the last century, consisting of two stems, each with its own pin, tightly fitted in a common stock but at right angles to each other. There are no wedges, screws, threads or fancy brass parts; just three pieces of wood and two small nails. The stems are simply pushed in or out to the needed measurement and stay there as a result of the tightness of the fit. At the other end of the scale are rosewood, ebony, and brass delights with hidden threaded rods and flush–mounted adjusting screws, polished, lacquered, graduated and gleaming. They are a tool fancier's delight and work just as well! In between are innumerable varieties with double arms, sliding inserts, double ended pins, screws and wedges too cunning to detail.

In common with most other gauges, the shorter the pin the better, but in the case of mortise gauges it is also important that both pins be of the same height. Better quality mortise gauges make provision for pin adjustment and replacement, but cheaper ones work just as well if you take care to file the pins properly, remembering to file the bevel on the inside edges.

The butt–and–mortise gauge mentioned earlier? This is a do–it–all tool once sold by Stanley™ designed to allow the user to set three different depths at once in order to speed up the layout of mortises for butt hinges. The three–edged butt template that is simply banged onto the door jamb, leaving an inscribed outline is an eminently simpler tool, but lacks the undeniable charm and mystery of the wood and brass masterpiece that preceded it. PW

Young Man In A Hurry

Scott Phillips is a young man and an old woodworker. How can that be? He's thirty eight years old and he built his first project, a footstool, in his grandfathers' cabinet shop when he was six. He's been a woodworker for thirty two years, which makes him an old woodworker in anybody's book. His involvement with wood has been continuous over those years. His grandfathers taught him woodworking and his father taught him to be a forester, of this he says, "Dad and I have always spent a great deal of time together, in the woods, fishing, exploring, and woodworking. He earned the first graduate degree in forestry given by Purdue University. He is a hard working role–model for me." With a background like this it was inevitable that Scott would follow his heritage. He went to Michigan State University and earned a degree in forestry and marketing. On leaving the university, he took a job as a veneer timber buyer and exporter. He also started a woodworking store called American Woodcrafters. Being a roving timber buyer and running a retail store don't seem to be compatible, so I asked Scott about this.

***If you have any questions** on the subject discussed in this article you may direct them to Ken Sadler, 75 NW 90th Ave., Portland, OR 97229. Mr. Sadler would also be happy to advise you on any other business related problems.*

You didn't stay in forestry. What led you to leave and what kind of business did you go into?

I believed I was contributing to the unsound forestry practice of "high grading" the timber I was buying. High Grading means a buyer buys only the highest grade trees in the woods. Ecologically this is disastrous because it eventually leaves only the less desirable genotypes in the woods to regenerate the forest. Over time the quality of the timber in the forests is degraded. I thought that this was wrong, so I left. I got involved in selling and marketing woodworking educational services.

How did you happen to become involved with Shopsmith?

They liked the American Woodcrafters store that I ran and offered me an excellent opportunity to help them develop their tool line and stores.

Was it their idea or yours to produce videos for training people in the use of the Shopsmith?

It was my idea to produce training tapes for the complete line of tools.

Were you involved in these videos in any way other than being the producer?

I was also the host. It was great work and I got a lot of very good experience from it. I did it for three years.

What gave you the idea of starting a woodworking tool business of your own and when did you do it?

I started the tool business to enjoy life more. My upbringing, education, and love of the woods and woodworking pushed me to get more involved in woodworking. A desk job was not for me.

What was it that made you believe that there was a market for the kind of tools you planned on selling?

Common sense, experience, and market research.

How did you do the market research?

I had done yearly surveys of customers at American Woodcrafters and at Shopsmith. These showed me that the woodworking market was growing at approximately 7% annually. More people were learning how to work with wood. This created a market for special tools to help them learn.

Did you quit your job and start the business or start the business as a part time effort?

I quit my job and spent all my time and energy on my new company, Sylvan Tool Works, Inc.

How much money did you invest to start the business and where did you get it.

I invested $20,000 of personal savings to start it up. That money has been paid back and I'm now making a comfortable profit every year.

Are you the only employee of your company?

Yes. It's just me.

You designed the tools and contracted to have them made for you. Please explain this.

I have all the tools made in Dayton, a manufacturing town, which is about thirty miles down the freeway from Piqua. I make a drawing of the parts, take it to a tool making company, and they produce the tooling so that I can produce the parts in quantities that will keep the price down. I pay for the tooling and then find a good company that can use my tooling to produce my parts. Then I assemble the parts. When I was with Shopsmith I did this sort of work for them and that's where I got the experience in subcontracting manufacturing to other companies. I also learned, through the competitive bid process, about many other companies that do cost effective quality work. That's how I learned the manufacturing process.

What kind of tools are they, ordinary or special, hand or power, large or small? Tell me about them.

I focus on quality, long–lasting, small hand tools. Every tool revolves around the idea of making woodworking easier and more accurate.

How many different tools do you offer?

One with three variations. The main product is the Tri–Gauge. I sell two, precise layout squares and one extremely powerful magnet. I have some other ideas for tools, but I haven't had the time or money to develop them myself, the way I have in the past. I've taken some clamp ideas to the two major clamp companies. We're just in the early phases of discussions on those designs.

In what price range are your present tools?

The present products retail from $9.95 to $24.95

What was your market and how did you reach it? Is the market the same and do you use the same methods now.

The market is anyone who works with wood and I reach it through woodworking catalogues and Woodworking Unlimited stores across the United States. These companies do the advertising and I wholesale my tools to them. However, the market is growing and in the future I'll advertise in the woodworking magazines and trade publications. I'll also continue to market the tools just as I do now.

Does that mean that you are going to do some advertising on your own that you will pay for?

Yes.

What kind of advertising, if any, did you do at the start and what kind do you do now.

I let the companies I wholesale my tools to handle their own approach to marketing them. Consequently, I pass along a considerable prices savings to the retailers, so they maintain better profit margins.

The reason you can do that is because you don't spend any money on advertising?

That's right.

But now you're going to spend money on advertising, therefore you're going to have to raise your prices and cut down on your dealers' profits? If you don't raise prices, you're going to cut down on your profits.

No, your theory is correct as far as my existing tools are concerned. What I'm talking about are some of my future tool ideas. For example, one specific tool is a new type of hand plane that cuts on the push and pull stroke. That's my big one that's coming out down the road. I can't give you any more details other than it's a new type of hand plane that hasn't been marketed before. That's a tool that I plan on advertising myself and I'll have to price it a little bit differently to the retailers and the catalogue companies. For my existing products, I'll just put them in a corner of the ad for the plane. I intend to buy half page ads, I think those are the most effective type in magazines. If you go any smaller than that, I think it gets passed over very quickly. So I'll be listing my existing products with a small photo along with the plane when it's ready to go to market. I'll just piggy–back on the ad space for a new tool.

What are your gross sales so far this year?

As far as the Tri–Gauge is concerned, I've sold approximately 5100 units in one year's time. They retail for $24.95, but I give a 50% discount. That works out to gross sales on that product of about $64,000.

What gave you the idea of producing a TV program?

Again the answer comes from common sense and market research. Woodworkers are spending over $3.5 billion each year on woodworking tools, lumber, and equipment. They need educational services to acquaint them with and help them develop new skills. There is a shortage of hands–on instruction. It's only natural to teach woodworking on educational public television.

Where did you find the facilities for such work?

As I was learning the various aspects of the video production business I started to hire different production companies, these were large companies. They always did good work, but when it came down to it, they weren't woodworkers. They didn't understand woodworking and they weren't willing to try new techniques with the camera without hiring very expensive equipment. They were old school video production houses that thought you had to use existing techniques to produce shows and that makes the production costs very high. That's why some other shows are so costly to produce, they're using traditional techniques.

I started to look around when I got into a bind on one of my productions. I needed to have it done sooner than the company I was working with could produce it. I heard about MainSail, which was basically seven people who had left a hospital multimedia job and started their own company. What impressed me about them was that they were lean and mean and they were good and very creative. I built a modest studio in my 32' X 32' garage and we started to do some video work that was outside the normal techniques because we had to. Instead of using a twenty–thousand dollar lens, we'd use a five–thousand dollar wide angle lens to get the effect we wanted. Instead of using dolphin arms and very expensive dollies, we used a hand held camera. Our camera man is rock solid and stands about six–feet–four. He and I do a dance together when we film the show. He's right over my shoulder because the perspective we try to give the viewer is that they're actually building the project. It's a subtle technique—the idea is to have the viewers feel that it's their own hands that are doing the work. If we used traditional techniques we couldn't get that effect because it would take too much time to get a dolly and the equipment in place. We're just a well–oiled machine working together creatively to come up with new ways of doing video for TV. It's a big learning curve and we make some mistakes along the way, but they can be cut out. It's a good group of guys, very creative and willing to try new things.

How was your show going to be different from the many that are already on the air, and what made you think that it would attract viewers?

"The American Woodshop" features very practical projects that are easy to make. I do not magically skip steps. I always use guards, focus on safety, and every show features a visit that explores the woodworking tradition. We cover every aspect of woodworking from the woodworker's prospective. I use both hand and power tools, and I approach the selection of wood, tools, and techniques in an uncomplicated way. If you watch my show, you'll see the difference.

What is the philosophy behind the show?

"The American Woodshop" is devoted to providing the highest quality woodworking educational programs possible which will safely and enjoyably increase the skill level of all woodworkers. We blend the best of woodworking traditions with modern tool innovations. The results are increased woodworker enjoyment.

How has the TV show fit into your tool business and where did the money come from to produce it?

The tool business is separate from the public TV series. It stands on its own. Delta International Machinery Corp. and Porter–Cable Corp. co–fund the production of "The American Woodshop."

What made you think you could get your show on the air and what did you do to accomplish this?

I first studied the woodworking programming that was already on the air. I saw that "This Old House" and "New Yankee Workshop" were consistently two of the most popular shows on television, not just public TV but all TV. I decided that what they were doing wasn't all that difficult. They were using a formula, and I watched what they did and saw that they were successful. I watched the market grow and I thought the market was ripe for another woodworking show.

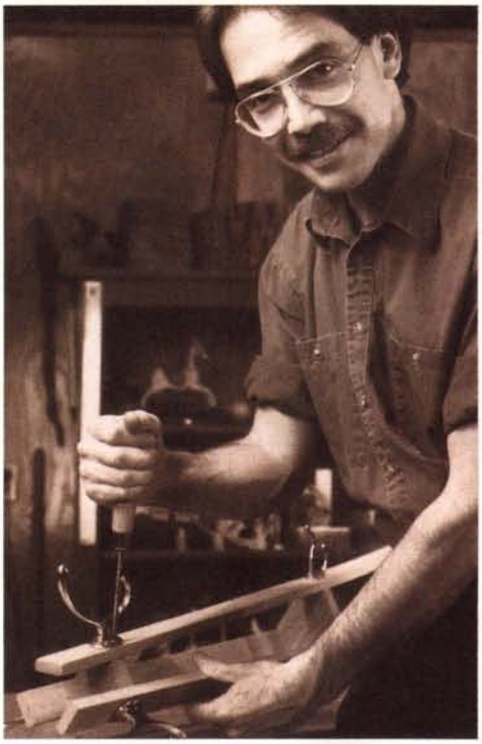
You decided that there was a place for it, but how did you convince someone in the business that this was so?

I was at the Chicago National Hardware Show working with the Delta International Machinery Company to produce a training tape and a marketing tape for a new product, their 12" variable speed wood lathe. As I did this I thought that since it's expensive to produce a pilot, let's see if we can use the training tape, modify it, take it to the Dallas American Program Service Public TV Conference, and offer it as the pilot for a new series. Delta said yes, that sounded good, let's do it. In this way Delta funded the production of the pilot for the series. This is a big hurdle for most TV productions because it's quite expensive to produce a pilot. However, in our case, using MainSail's creativity and an efficient shooting format we were able to produce that pilot for about one fifth of the normal cost.

When we offered it, it was one of seventeen new programs that were accepted that season. All the Public TV program directors were there. They watched seven minutes of the show and 89 stations said they wanted it. This was great for us because our target had been 45. The demand was there.

Has it been a continuously running series or has it been broken into two or three groups of program?

We've completed two seasons, twenty six shows. The second season started three weeks ago and it's running now. It picked up at the end of the reruns of the first thirteen.



Delta International Machinery Corp. and Porter–Cable nationally co-fund* The American Woodshop *for PBS.

Is that how it's handled, run it for thirteen weeks and then rerun it for thirteen more?

Exactly, until you have enough shows to keep them all original. Every season you produce thirteen shows, that's the magic number for TV programming because that's one quarter of the year and that's how they schedule all their programming. This is true of both public and commercial TV. Once you run thirteen programs, then you bring in thirteen new ones, then you rerun the first thirteen. That's how you block in time. Since we're a new series, we only have twenty six shows so we have to alternate back and forth between the first thirteen to hold our time slot. That creates some programming challenges because if a station planned not to do reruns, then to hold on to the slot I have to alternate with other woodworking shows to fill the slot so the audience becomes accustomed to tuning in at that time. The goal down the road is to have new programming every year. I will produce thirteen new shows each year.

How much time does it take to produce a series?

It takes a good, solid three weeks to produce one show because I don't have any helpers. I always built the projects. I have to build three projects complete for every one you see on the show. I have to have one done to show the viewers, one that I build on the show, and a third one that I build after the show is done to take photographs of for the book. We have a visit with a special woodworker on each show. These are filmed at the visitor's home shop and the visitors live all across the country, so quite a bit of time is taken up in travel.

How successful has it been?

Season one averaged a 1.79 Nielsen rating. That means we are viewed by 1.5 to 2 million viewers each week. We're very happy with these results. We currently reach 90% of the markets throughout the United Sates, and air on 186 stations. Basically, the level of success can be monitored in one way and that's the people who are watching the show. In the Nielsen ratings we are now consistently averaging a 2 rating. As our ratings go up, and they're going up this year, we get more stations to sign up, we have 74 more stations this year than we did last year. Our ratings are better than most shows on public TV and as a consequence, we're getting much better programming time. I just got some information yesterday from Houston Public Television on our first show of season, two which drew a 4 rating and a 10 share which made it the most popular show that day. They're putting us into their prime time now and we are competing very well there. This was a surprise. We thought it would be a Saturday–Sunday block, but it turns out that it airs very successfully in prime time—in fact, our average rating in prime time is 2.7.

Does that mean that you're on during weekday evenings?

Exactly, weekday evenings in the time slot from 6 pm to 11 pm.

Has doing the show interfered with you running of your tool company in any way?

Yes, it has delayed the introduction of several new tools.

Do your tools get any publicity on the show?

No. I occasionally use a scale or one of my squares, but I purposely do not promote my tools on my show. The show is about woodworking, not promoting tools.

How have you and/or your company benefited financially from the TV show?

Public television is, by its nature, non–commercial. Consequently there isn't a great deal of compensation in producing the show. However, I make many guest appearances across the United Sates and Canada and I make money from this. I also write, produce and market books on the projects done on the show.

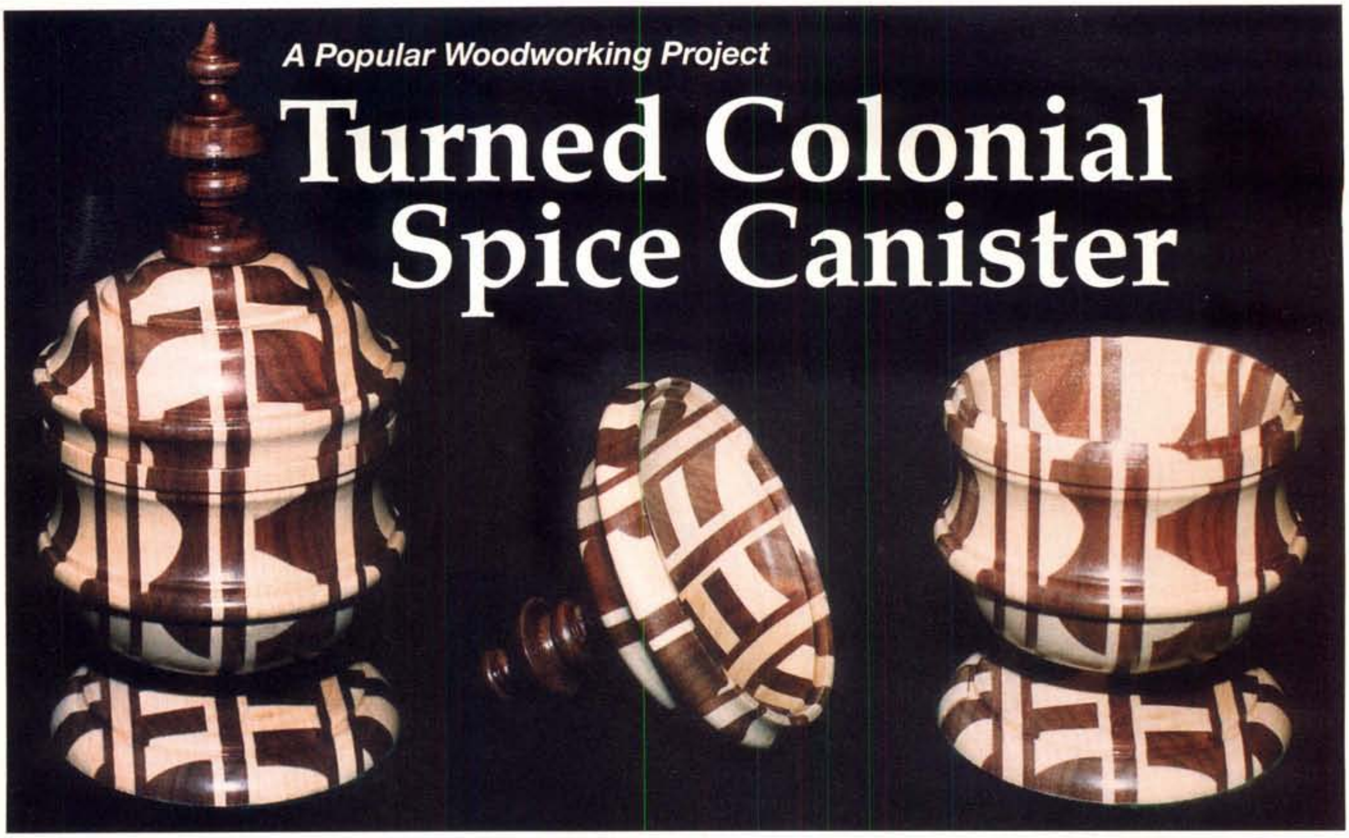
Do you plan to continue making these TV shows?

God willing, you bet.

Yes, Scott is a young man in a hurry. At 38 he has turned his love for wood into a successful career which he built out of his imagination and optimism. He's done it with determination, discipline, and the confidence that he could succeed at whatever he tried to do. The story behind this story is that this sort of achievement is not limited to the young. These qualities are not unique to Scott Phillips, they're there for anyone to acquire. With them you can build your career to whatever heights you may aspire, no matter what age you may be.

A Popular Woodworking Project

Turned Colonial Spice Canister

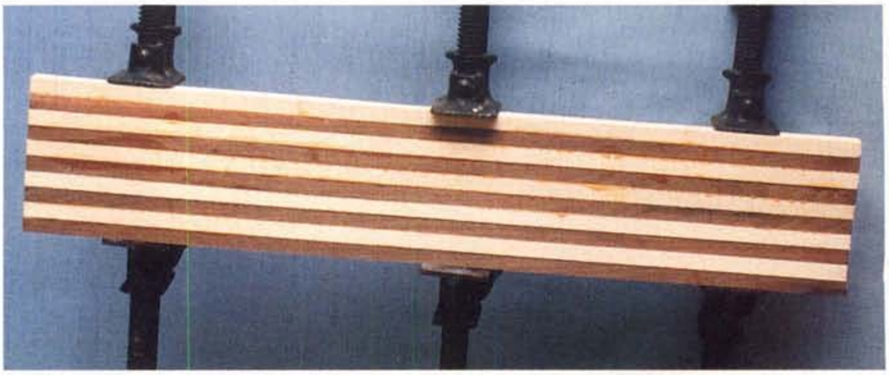


by William Scherer

A box of old magazines purchased at a garage sale turned out to be a project bonanza. The box was full of craft magazines, most of which are no longer in publication, dating from the 30's, 40's and 50's. One of the interesting lathe projects I discovered was this reproduction of an early American wooden tea or spice canister. It was originally turned by a colonial craftsperson using a block built from small strips of light and dark wood to produce a checkerboard and inlaid pattern. This canister was originally measured and plans were drawn by Lester Margon, a designer and writer *in the* 1950's who specialized in drawings of museum pieces for craft magazines. Its unique design and pattern make it a nice lathe project for today's turner as well.

Preparing The Turning Piece

Select two hardwoods that have good color contrast such as black walnut and birch, beech, or even maple if it's white and not tan. The dimensions of the block and its components are given in Figure 1. One piece 3/4" X 5" X 24½" of each wood is needed for the alternating strips. Cut 5 strips 3/4" X 7/16" X 24" from each board. Alternate the colors and glue up the blank. After the glue is dry, plane the board to 11/16" and cut it into four 6" long pieces. The three sandwich assemblies require one piece of dark wood and one piece of light wood each 3/4" X 5" X 13". Resaw and surface these so you have four thin plates of dark wood and two thin plates of light wood each 1/8" X 5" X 6" long, and one dark plate and two light plates each 3/16" X 5" X 6" long. Some surfacing with a nice sharp hand plane may be required after re–sawing so the plates fit together nicely. Glue and clamp the sandwiches together. Note that one sandwich contains two birch plates and one of walnut and the other two sandwiches contain two walnut plates and one of birch. Check the fit of the various layers and do whatever



Rip the alternating strips then glue them to form a flat panel

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William Scherer *is the author of* Building Fine Furniture, A Simple Uncomplicated Method *(Sterling Publishers, New York).*

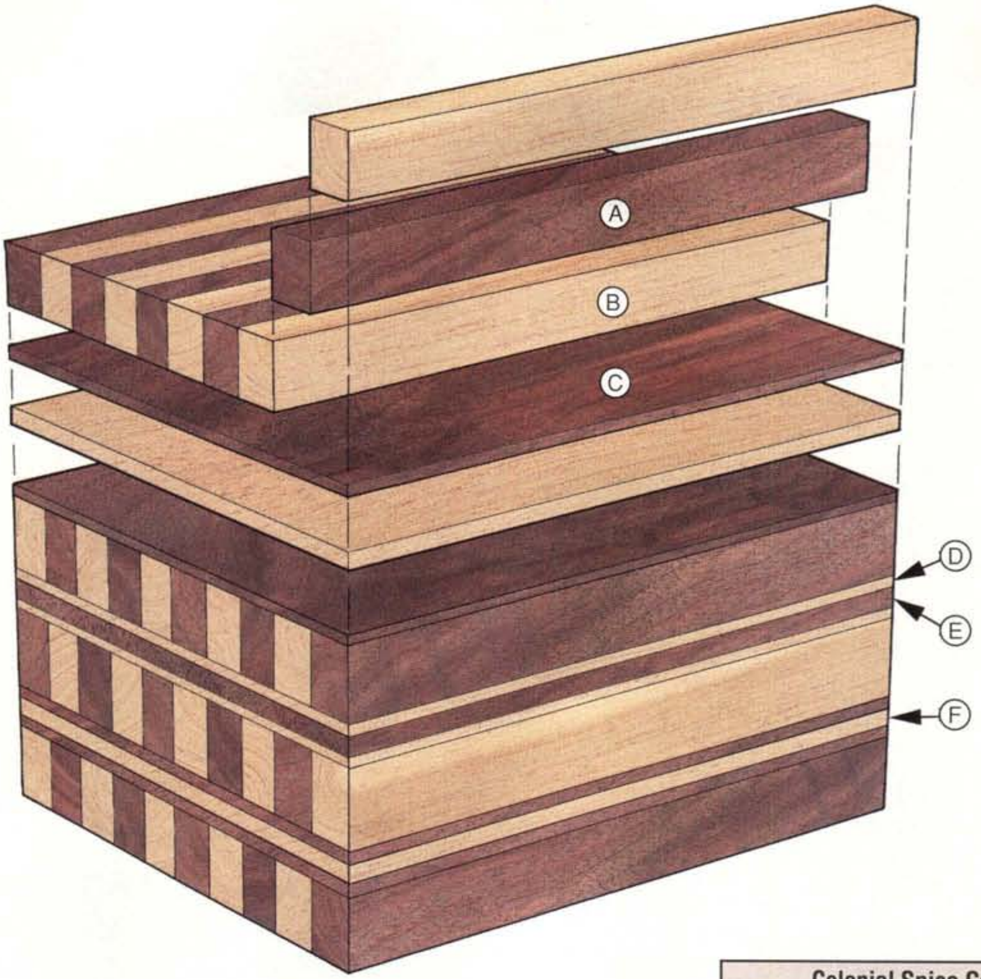


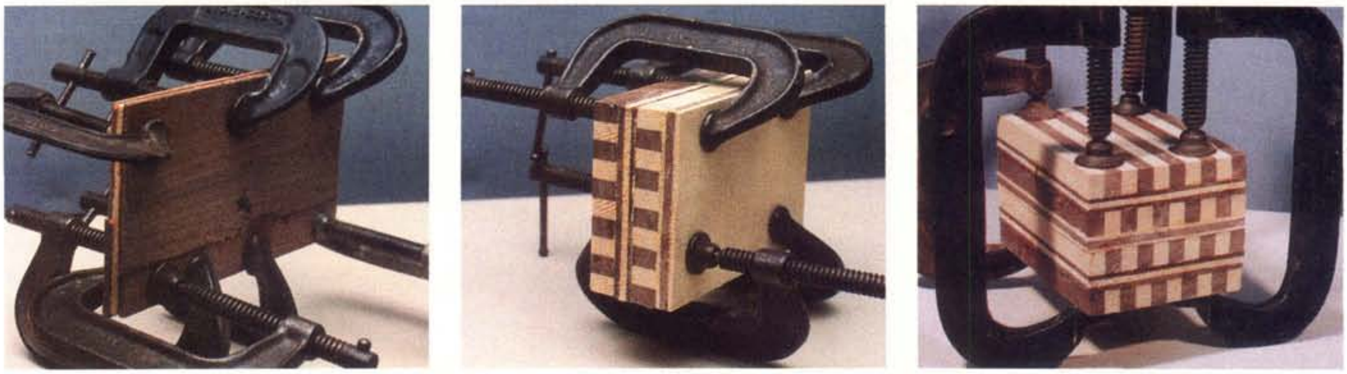
Figure 1

planing is necessary to make a good close lamination of the block. I found it easier to make two sub–assemblies rather than attempt to glue all the layers together at one time. Pay particular attention to the alternating pattern as the assemblies are glued together. The final assembly is pictured below right.

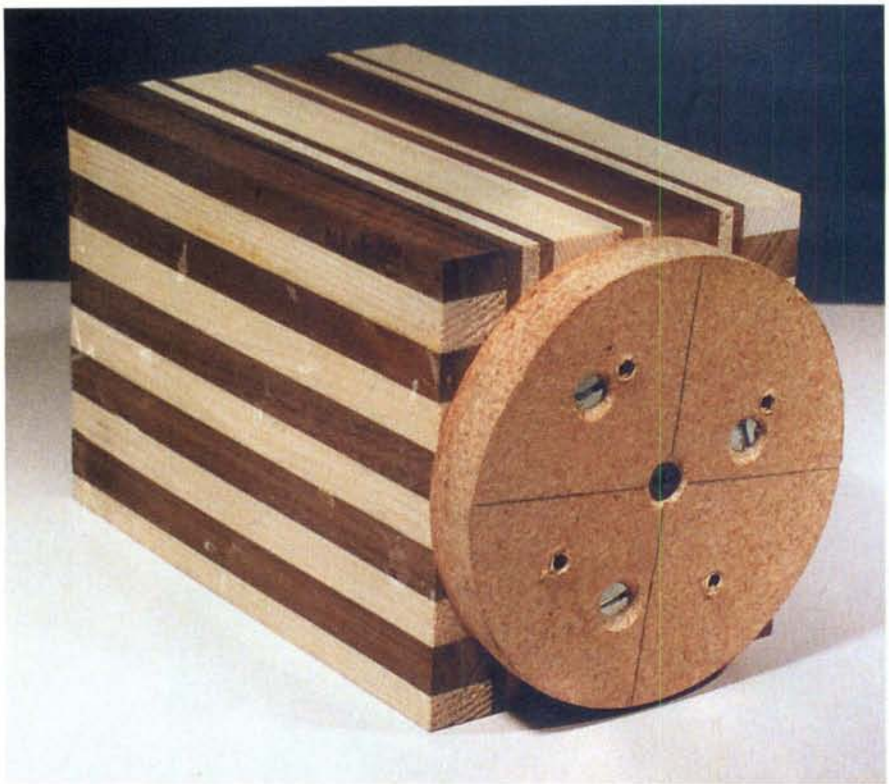
Preparing For Turning

Because this project begins as a spindle turning mounted between the lathe centers, but ends up as a face plate turning, mount the block on the face plate. Square up the ends of the block and mark the centers with diagonal lines on each end. Prepare a mounting surface for the face plate that is about the size of the finished diameter of the canister. Drill a centered shank hole in the mounting piece and a centered pilot hole in the canister end. Fasten the mounting surface to the canister block with a #12 X 1½" FH wood screw. Use two #8 X 1" FH wood screws to securely fasten the mounting piece to the base of the canister as pictured on the following page.

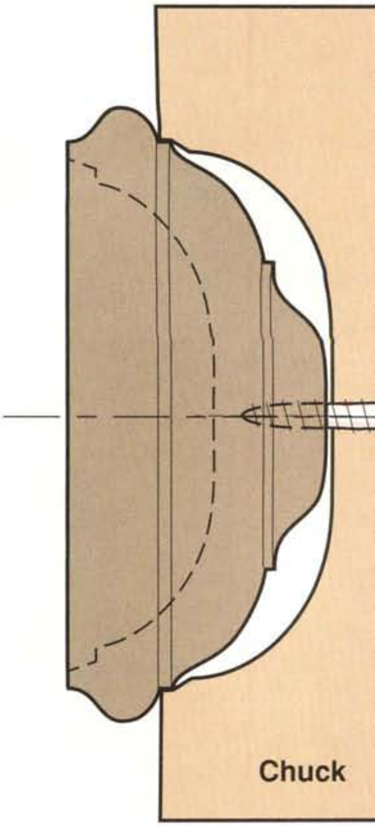
Colonial Spice Canister					
Cutting List					
		Finished Size			
Qty	Prt	T	W	L	Piece
20	A	11⁄16"	7⁄16"	6"	dark strips
20	B	11⁄16"	7⁄16"	6"	light strips
4	C	1⁄8"	5"	6"	thin dark plates
2	D	1⁄8"	5"	6"	thin light plates
1	E	3⁄16"	5"	6"	dark plate
2	F	3⁄16"	5"	6"	light plates
1	G	2	8	6"	chuck



Glue up the laminated sandwich assemblies in the order shown above. Be sure to apply even pressure when clamping.

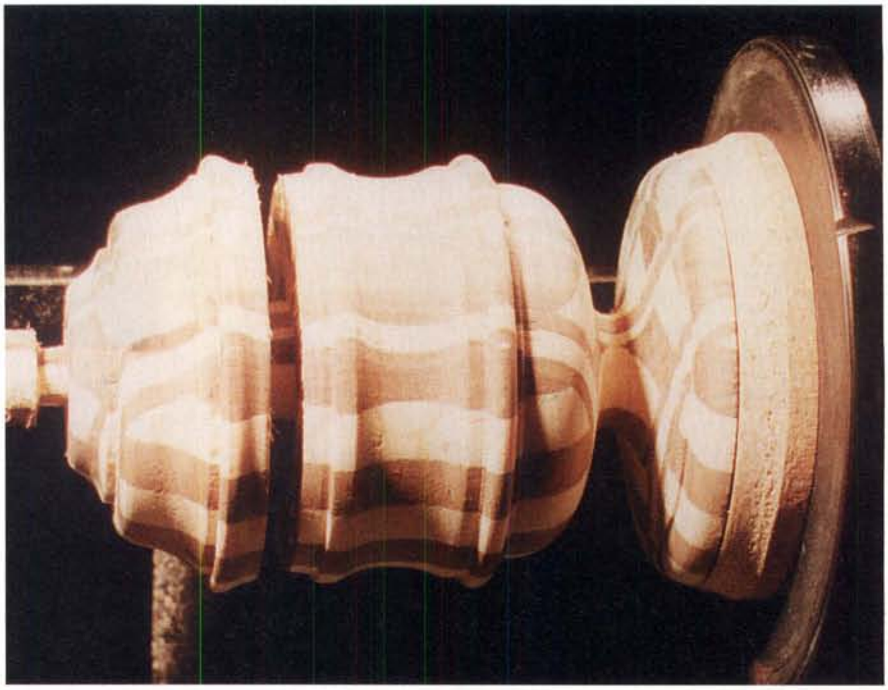


Make sure the screws which secure the backing plate to the block don't interfere with the face plate holes.



Turning The Canister And Cover

When you begin the rough turning, it's a good practice to move the tail stock and center to securely hold the opposite end of the block. Turn the block until it's round—the diameter should be about 4$^3/_8$". Use the parting tool to lay out the length of the canister and to separate the cover from the canister as shown at right. Follow the profile provided in the PullOut™ Plans to turn both the canister and the cover to shape. It is necessary to move the tail stock out of the way to complete the lid. Sand the exterior at this point starting with 80–grit sandpaper, then 120–, and finally 220–grit. Be certain to mark the exact center point of the lid with the parting tool at this time. After sanding the exterior, use the parting tool to cut the cover away from the canister. If you're uncertain about parting the top all the way off, part to a point you're comfortable with and complete the cutting with a fine toothed hand saw.

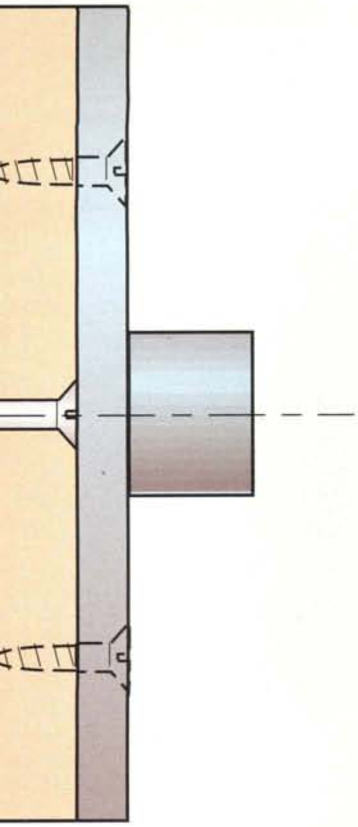


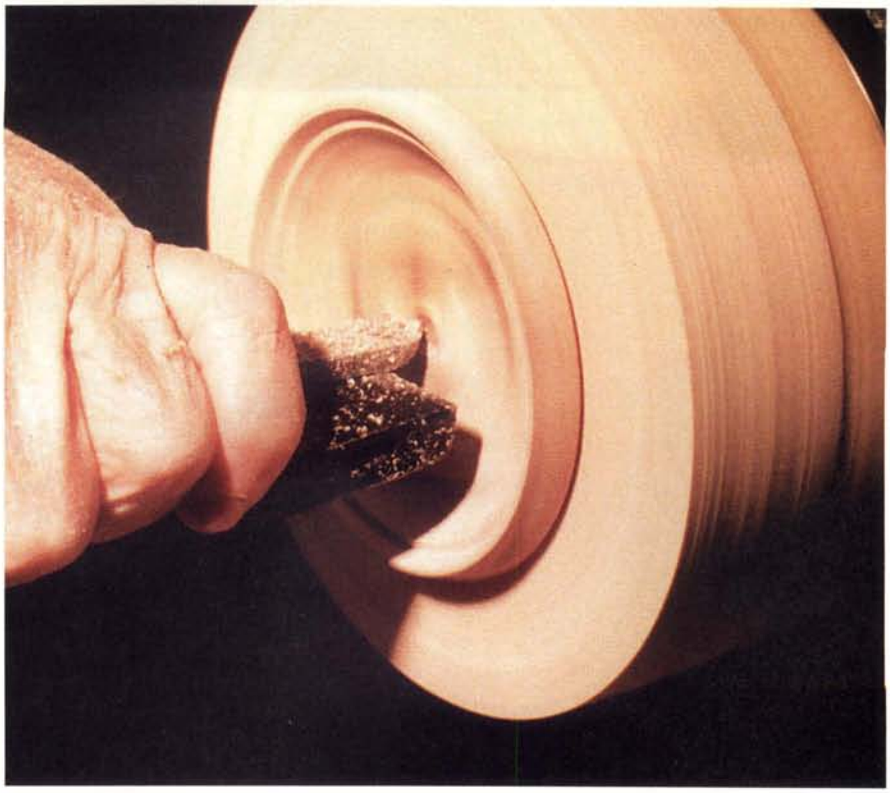
Exercise care as you part the lid from the base.

Turning The Interiors

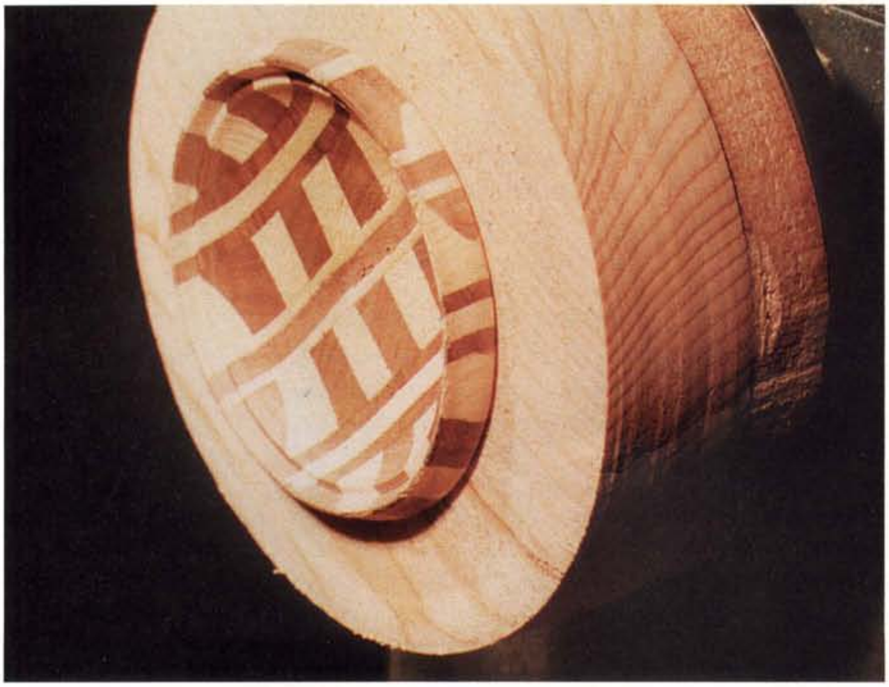
This is straightforward interior bowl turning and should present no problems. Experienced bowl turners will probably own a bowl turning gouge which does an excellent job. However, lacking this gouge, a well–sharpened bull nose chisel does an adequate job. Bear in mind that you're cutting end grain, so progress will be slow at best. Take light cuts and keep the chisel sharp with frequent honing. Sand the interior when completed. The canister can be finished at this time using a French polish or several coats of Deft or shellac. Use fine (0000) steel wool between coats as the piece is spinning in the lathe. Finally, apply and buff a coat of good paste wax to complete the finish.

A three–jawed chuck might work to turn the inside of the cover if it will





Periodically remove the lid from the chuck to gauge its thickness.



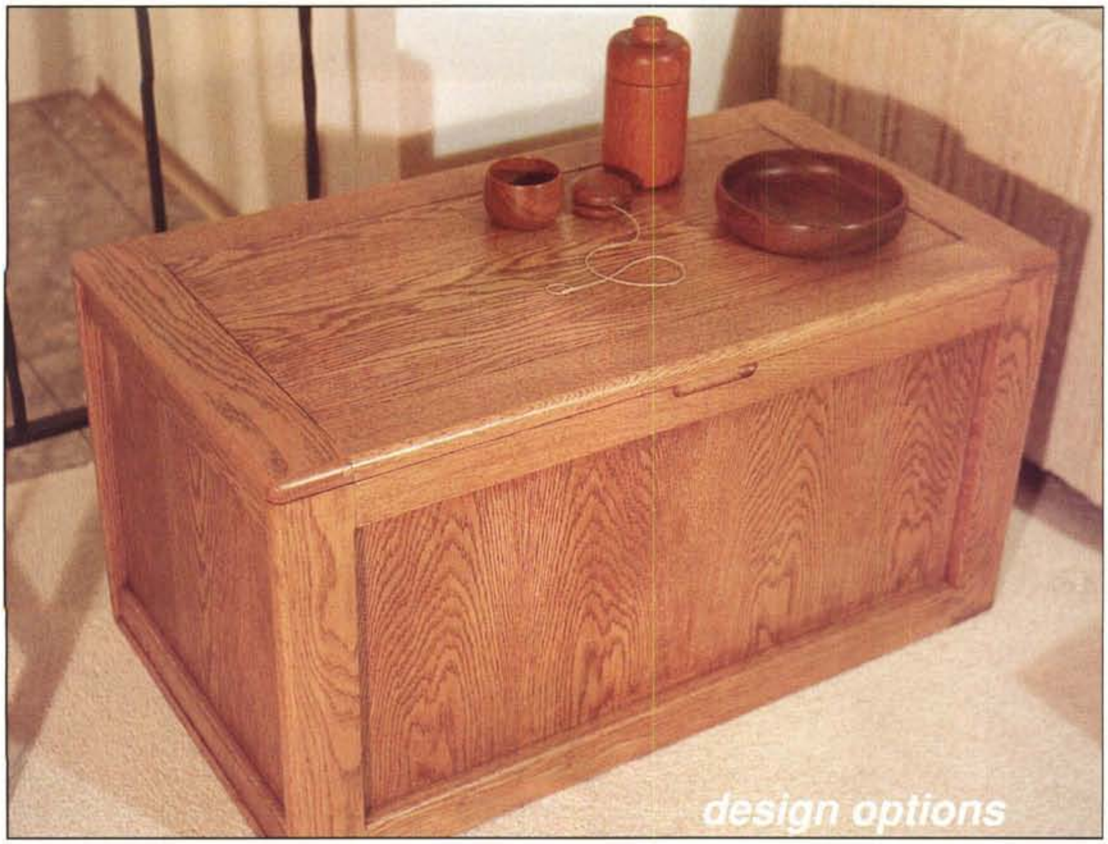
A well turned lid settles on the base on a cushion of air.

handle a piece 1½" thick. However, if you don't own such a chuck, a shop–made chuck will do. Use a piece of standard 2 X 8 and layout a 6" circle with a compass. Cut it out on the bandsaw. Fasten the chuck to a ¾" face plate mounting piece with screws or by gluing and clamping the two pieces together. Mount the assembly on the lathe and true up the outer edge of the chuck. Carefully lay out the diameter of the hollow you'll turn to accept the cover. The cover should rest solidly and snugly in the chuck in a groove made to accept the shoulder cut on the lid as pictured above. Proceed to remove the interior material of the chuck until the lid rests in place as indicated. Next, mark the exact center of the chuck, then remove the face plate and chuck from the lathe. Use the drill press to drill a shank hole for a #12 X 1½" FH wood screw through both the chuck and the mounting piece to hold the lid in the chuck. Drill a pilot hole in the top of the lid and fasten the cover firmly in place to the chuck. If it's necessary to remove the chuck from the face plate, be sure to mark its position on the face plate. Carefully turn the mating edge of the cover to match that of the canister. Sand and finish the interior at this time as well. The exterior of the lid is finished after the lid is removed from the lathe.

Turn the finial from a piece 1½" X 1½" X 6" long. Follow the outline given in the PullOut™ Plans and pay particular attention to the ¼" mounting pin on the bottom of the finial. Sand and finish the finial while it's still mounted between centers. Some touch up will have to be done after the piece is removed from the lathe, and the tip carved to a point. Finally, drill a ¼" hole in the top of the lid for the pin of the finial and glue it in place. PW

A Popular Woodworking Project

Cedar Blanket Chest



design options

frame and panel construction p.34

by Garth Graves

Woodworking, as with most avocations, cycles from dry spells to churning out multiples of the same project. My last cycle was spent building cedar blanket chests. I chose cedar because of its aromatic qualities—cherished by humans—despised by moths, and built more than one chest because my wife and two daughters each requested one. Of course, each chest had to be styled to meet the taste of the individual recipient.

The chest I designed for my wife is modeled to fit our Spanish style bedroom furniture. The middle design (for the middle child) sits at the foot of a single bed in our daughter's duplex. The third, the subject of this article, is for our newly married daughter. Her bedroom is already filled with a long queen–size bed, so the chest will reside in the living room and double as a coffee table. It's designed to match her 'unfinished furniture' wall unit.

You can build this chest to match the wood, style and finish of your surrounding furniture. Building the box out of 1/2" veneer plywood, in this case white oak over luan, simplifies construction and minimizes joinery. The plywood box provides the structural support for the cedar lining and exterior molding.

Garth Graves is on the cover bar and works wood in San Diego, CA.

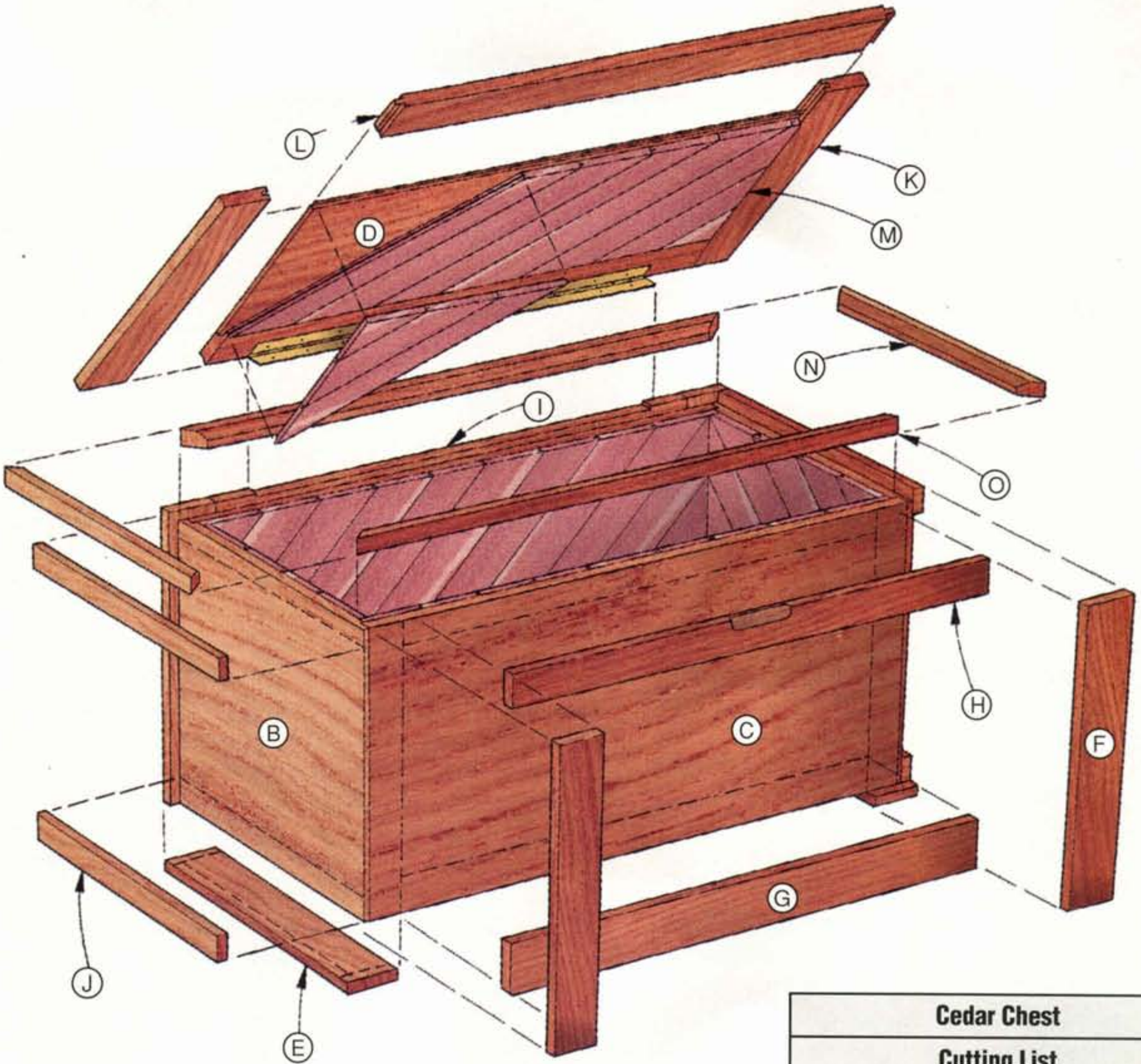
Construction

Layout the panels for the bottom, ends, sides and top (A, B, C and D) on a piece of ½" plywood. Pay close attention to grain direction so you get the most out of your plywood and utilize interesting grain patterns. Cut the panels to the sizes given in the Cutting List. Cut rabbets in the ends to receive the sides. Cut dadoes in the ends and sides to receive the bottom, dimensioned in Figure 1.

Assemble the plywood box with the bottom in place. Use glue, screws and clamps to achieve a square box. When fastening into the plywood core, cant the nails or screws along the fastening line at opposing angles. This helps to avert pull–out from what may be a weak plywood core. Set the screws flush from the outside, they'll be covered by the exterior molding.

Molding

Cut the frame pieces and the end trim pieces (parts E, F, G, H, I and J) to the sizes given in the Cutting List. The end frames overlap the front and back sides by 2 1/4" to inset the end panels by 3/4". Screw and glue the end frames (E and F) directly to the plywood from the inside of the box. Screw the bottom end frames (E) into the side end frames (F) from underneath.



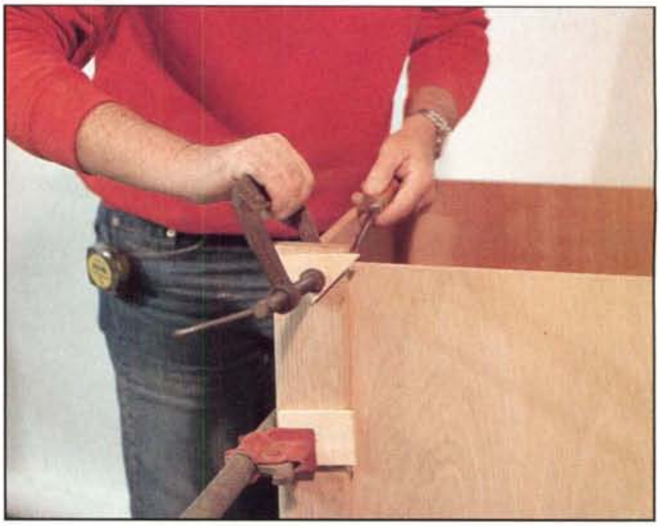
Butt–join the surrounding frames (G, H and I) at the corners. Before attaching the front upper frame, rout the finger lift recess using a 3/4" diameter core box bit, shown in Figure 2. Center this 4" long recess across the upper frame piece. Use a roundover bit with a guide bearing to ease the outer edges of the end frames. I also used a smaller roundover bit to soften the top inside edges. Fasten the lower frames (G) and the upper frames (H and I) to the box between the end

Cedar Chest

Cutting List

Qty	Part	Finished Size			Piece
		T	W	L	
1	A	½"	18⅜"	34¼"	bottom panel
2	B	½"	16½"	17⅞"	end panels
2	C	½"	16½"	34¼"	side panels
1	D	½"	13⅞"	29¾"	top panel
2	E	¾"	3"	19⅜"	bottom end frms
4	F	¾"	3"	17¼"	side end frames
2	G	¾"	2¾"	29¼"	lower frames
1	H	¾"	2"	29¼"	front upper frame
1	I	¾"	1⅞"	29¼"	back upper frame
4	J	½"	1½"	17⅞"	end trim
2	K	¾"	3"	19⅜"	top ends
2	L	¾"	3"	29¼"	top sides
1	M	⅜"	3½"	24 sq'	cedar lining
2	N	¾"	⅞"	17⅞"	end caps
2	O	¾"	⅞"	34¾"	side caps

1. Round–over the edges of the frame pieces before attaching them to the plywood shell.



2. Fasten the frames to the shell with glue and FH woodscrews driven from the inside.

frames. Fasten the trim pieces (J) to the plywood box between the end frames as shown in the assembly drawing.

Rabbet the top plywood panel (D) and dado the surrounding solid frame pieces (K and L) as shown in Figure 2. Cut 1/4" X 1/4" tenons on the ends of the top side frames (L). The dado in the top end pieces receives the top and forms the mortises for these tenons.

Cedar Lining

Aromatic red cedar is available in a variety of forms. One approach to this project might be to use cedar veneer plywood. A drawback to using this is the minimal thickness of cedar used for the veneer, which will soon loose its aromatic quality. Solid cedar boards offer longer lasting aroma however, if using paper wrapped cedar be sure to inspect it for moisture before using. If it is wet the moisture can seep into the adjoining wood and effect the finish. If the cedar appears wet, especially around the cut off ends, allow the stock to air dry before using.

I used 3/8" X 3 1/2" tongue and groove cedar in a diagonal pattern for the chest. Bundles come in sizes of 24 and 40 square feet. Count on one 40 square foot bundle for each 32 square feet of surface to be covered. Some lengths run fairly long. Use the longer pieces for the long diagonals and save the shorter pieces for sectioning in tight corners.

You can apply the cedar paneling parallel to the top edges or cut them at 45° miters as I did. The paneling on the sides and ends extends from the top surface of the bottom paneling and is flush with the top of the plywood. First apply the cedar to the bottom of the chest. Cut lengths to fit, and glue and nail them at their ends. The side lining will cover the bottom nails. For the final piece of each surface, rip away the tongue so the piece can drop into place.

To minimize splitting of the lining pieces, pay particular attention to the grain where it is fastened. Select lengths from pieces where the ends are clear wood. If an end is highly figured, or close to a knot, drill a pilot hole to prevent splitting the wood. Be careful to avoid denting the wood with the ham-

Figure 1 end

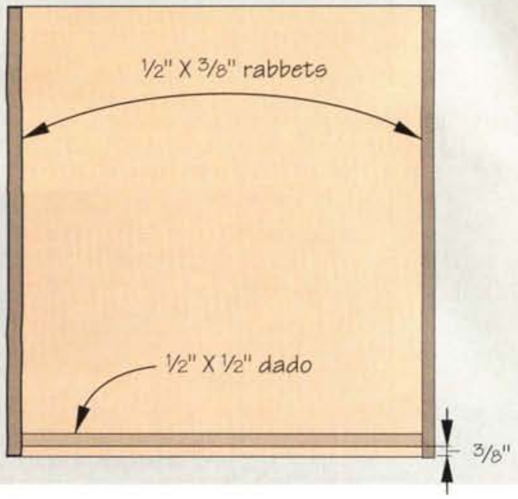
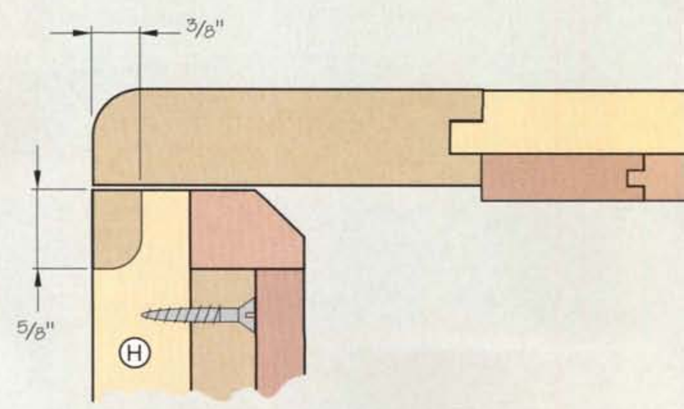
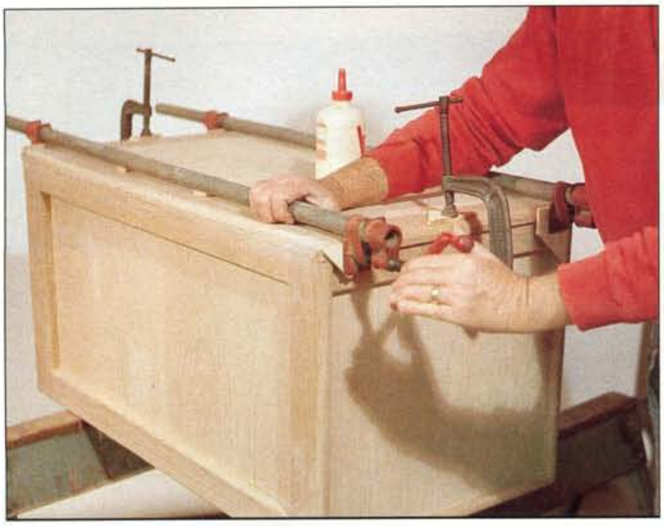


Figure 2 lid and side cross section





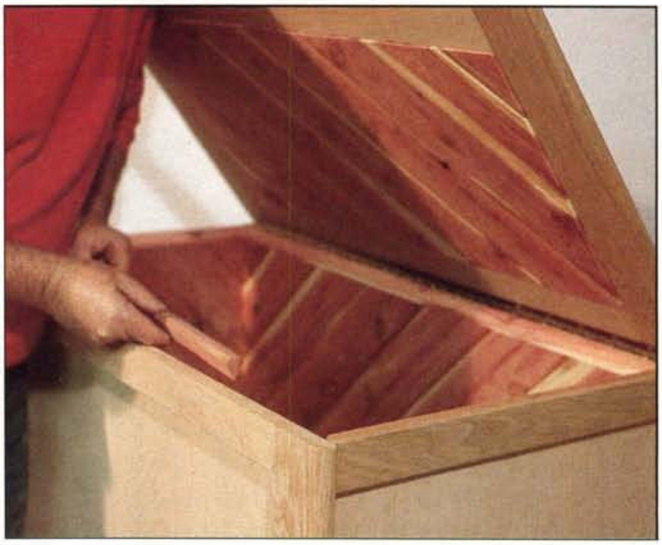
3. Dry fit the top pieces together. Clamp the top ends to the chest before gluing the top assembly together.

4. Measure and cut the cedar lining strips to fit inside the plywood shell. Attach the lining with glue and brads.

merhead. Use a small tack or a ball–peen hammer and a nail set. Cedar colored box nails are also available. Cut the end and side caps (N and O) to the sizes given in the Cutting List. These strips cover the plywood edges and cedar lining. Bevel or round over the top inside edge of the caps for appearance. Glue and finish nail the cap strips in place with 45° miters in each corner.

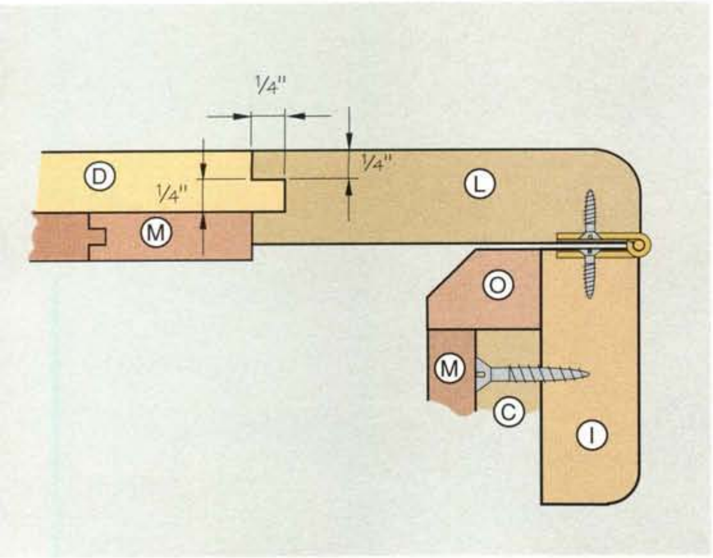
Hardware and Finishing

I mortised a continuous piano hinge flush into the lid. A limiter, such as a brass chain or box lid support, prevents the lid from opening too far. Locks and latches are available and can be added if they fit your design.



5. Cap off the exposed edges of the cedar lining and plywood with cedar strips.

For safety and convenience, counterbalanced or spring–tension lid supports work well on blanket chests. These come in various rated strengths based on lid weight and the front–to–back dimension of the lid. Weigh the lid before attaching it to the box. Spring strength, rated in inch–pounds, is calculated by multiplying the lid weight by the front–to–back width ÷ 2. For this project the calculation is 12.82 lbs X 19.25" ÷ 2 = 123.4 in–lbs. Supports are rated 35–40 in–lbs, 45–55 in–lbs, and 95–125 in–lbs. I was at the top of the range, but the supports work well. These are available in left, right and center configurations. If you want both a left and a right support, use two, rated at one–half your calculated total force.

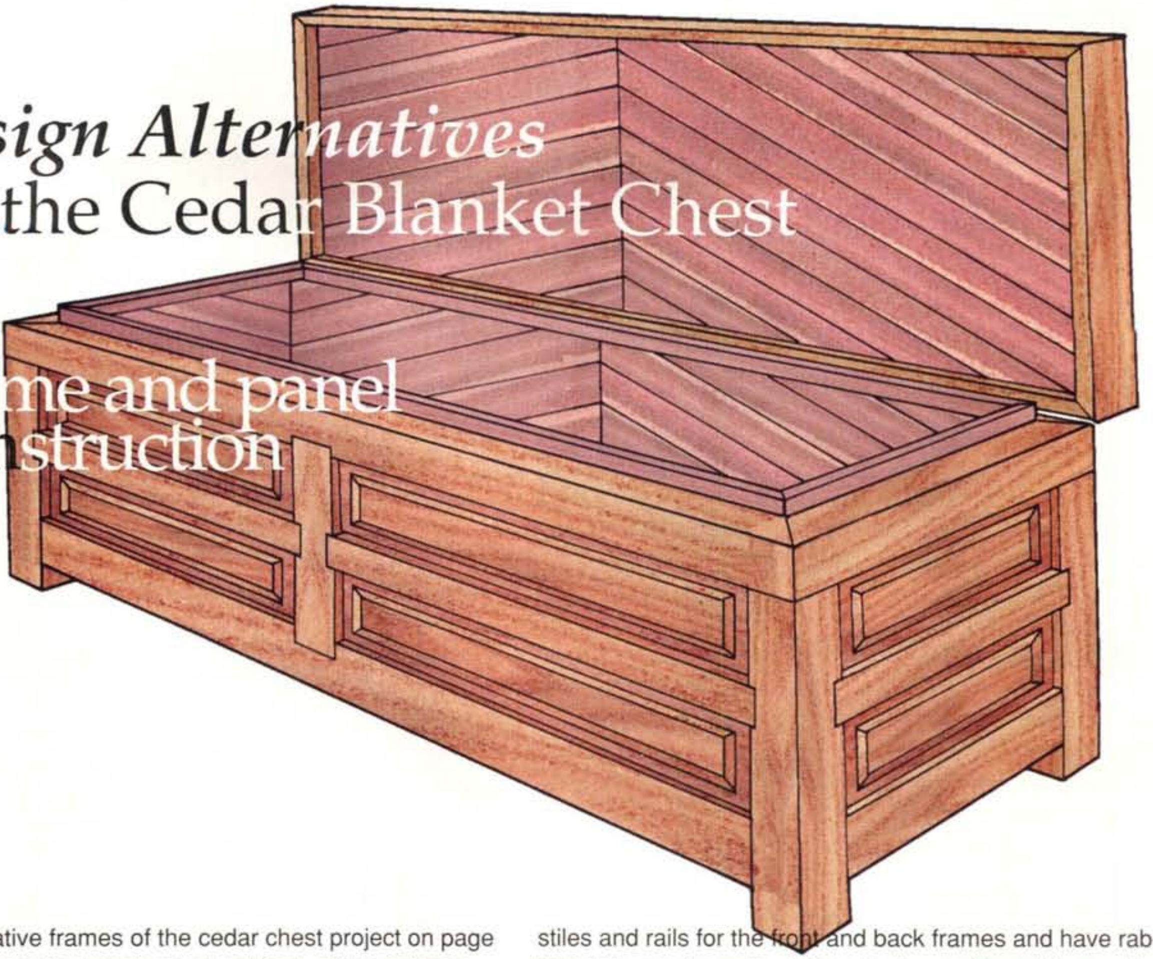


Installation can be a little tricky. Attachment locations, relative to the hinge pin, are critical for smooth operation and fit. Buy the chosen support(s) early to help you plan your installation. You might have to remove some cedar lining (or postpone paneling in the support area) to install the lid supports as recommended by the manufacturer.

I used a wipe–on/rub–off stain and a wipe–on protective clear coat for this chest. These products penetrate evenly to give an consistent tone. After staining, select a clear coat that best matches the surrounding furnishings. Leave the cedar bare so the moths will get a good whiff of the aroma.

Design Alternatives
for the Cedar Blanket Chest

•frame and panel construction



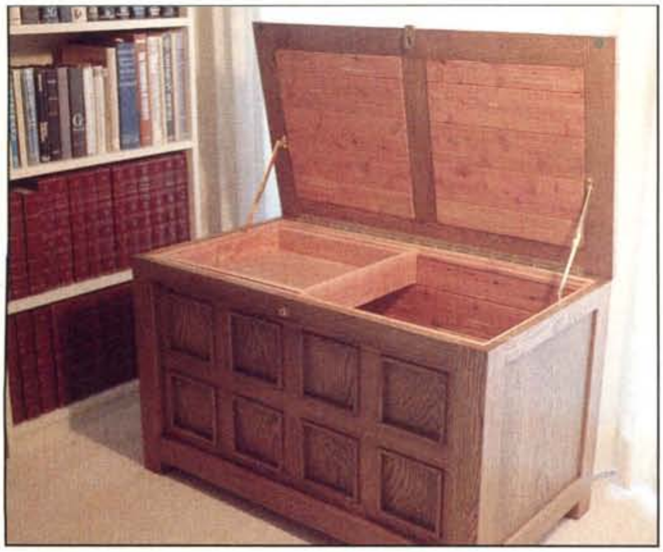
The decorative frames of the cedar chest project on page 30 take their form from their structural look–alikes in frame and panel construction. The methods for attaching the cedar lining and bottoms to the cases are the same.

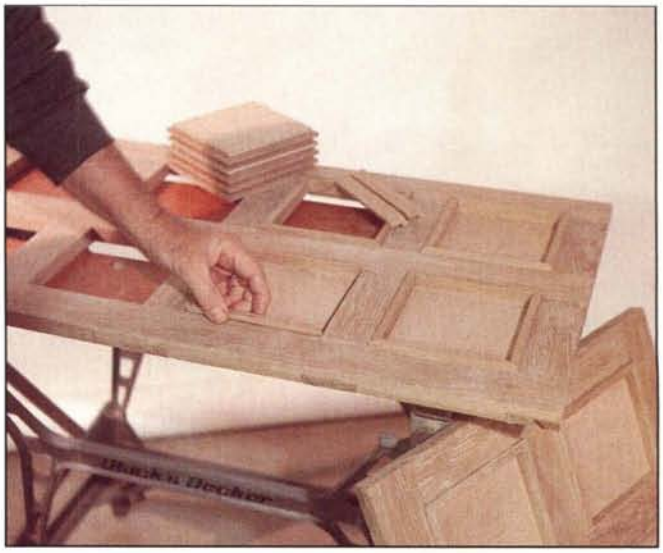
The two boxes shown in the illustrations above use different methods for attaching the end frames to the front and back frames. In one, the mitered stiles of adjoining frames are biscuit joined together for a simple and strong joint. The other method uses two vertical strips in each corner—structurally supporting and joining the frames while echoing the frame members in design.

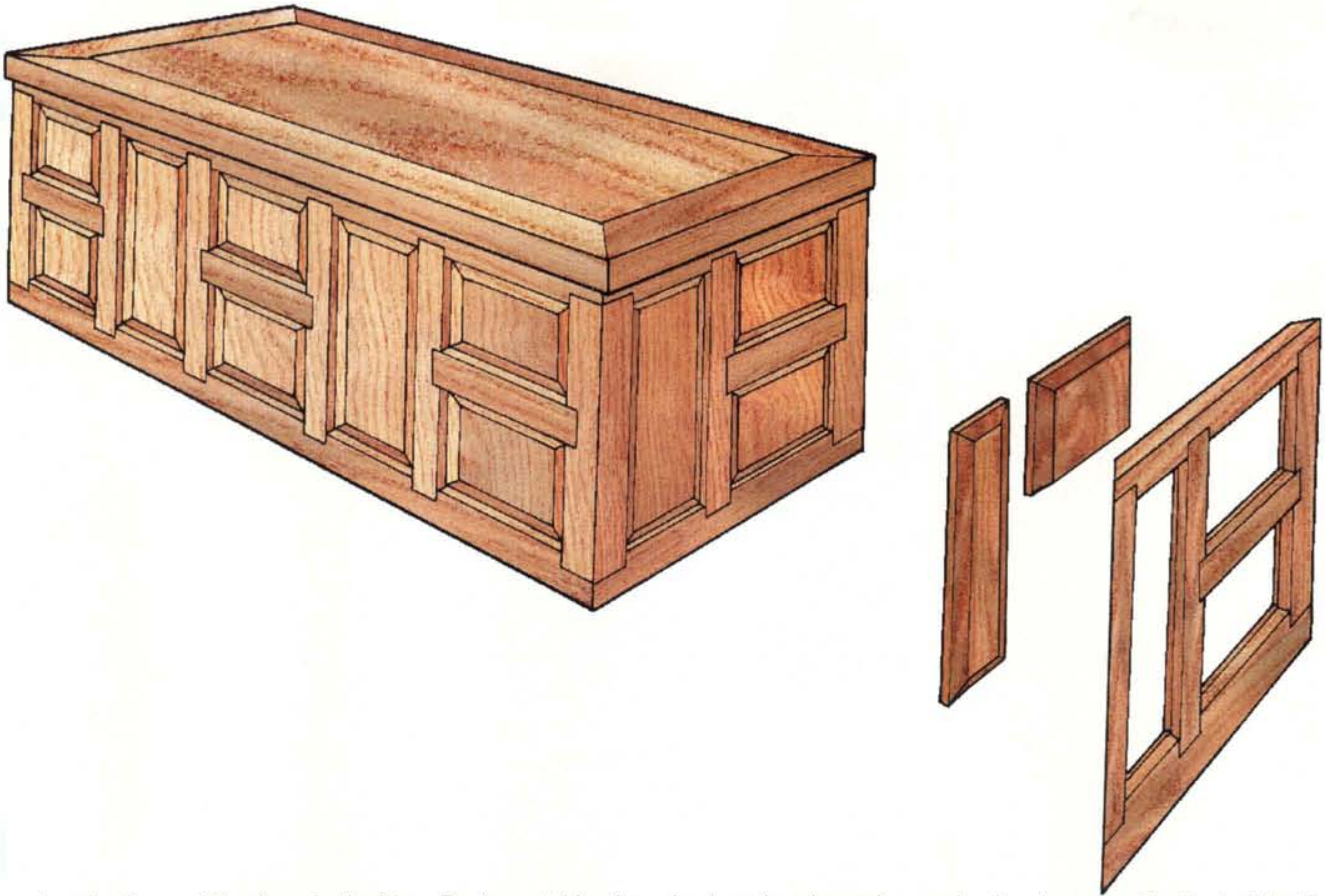
The design shown below uses cross–lapped 3/4" white oak stiles and rails for the front and back frames and have rabbeted plywood panels. Although plywood is not the most satisfying wood mediums to work, it does have a few positive attributes. Its major advantage being that it doesn't expand and contract with the seasons like solid wood.

In a cross–lap design, long lateral rails may tend to bow. If there is a definitive ring pattern in the stock, dado the lap joint on the side where the rings arc downward. Any unintentional bend is then easily countered when the panels are installed in the frame.

The panels can be placed anywhere within the thickness of the frame. They can be flush with the back or inset and







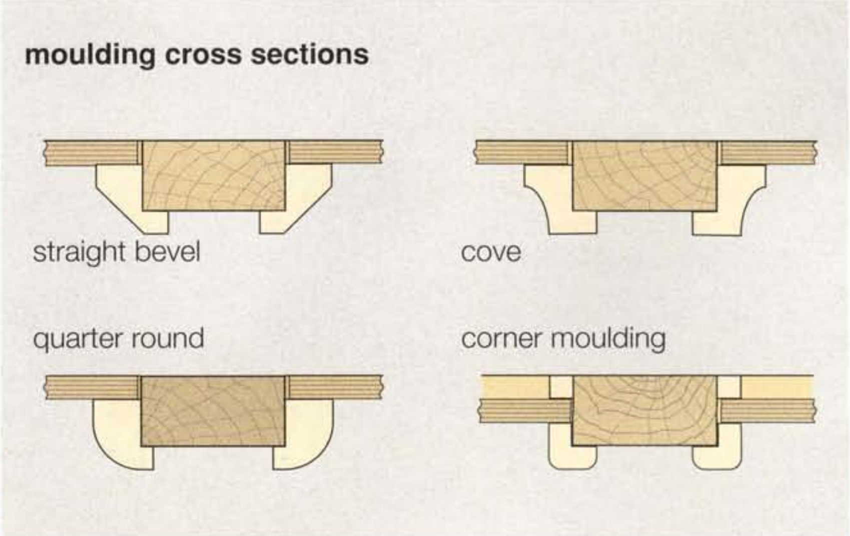
captured with moulding from both sides. On the outside, the molding can be flush with the outer surface, filled with quarter–round, a simple bevel, shim stock or something fancier such as window moulding. Use molding to make interesting transitions between the frames and panels. It is also possible to rabbet a groove around the frames where they enclose the panels, thus heightening the shadows surrounding the panels.

Four approaches to panel frames are shown in the illustrations at right. Use moulding pre–milled to the desired cross section or cut your own cross section design that is best suited to the overall look of the piece. If you want a straight bevel, a hollow–ground finishing blade provides a smooth surface. Additional design differences include horizontal, verses diagonal orientation of the cedar paneling and the addition of a sliding half tray to hold *smaller items*.

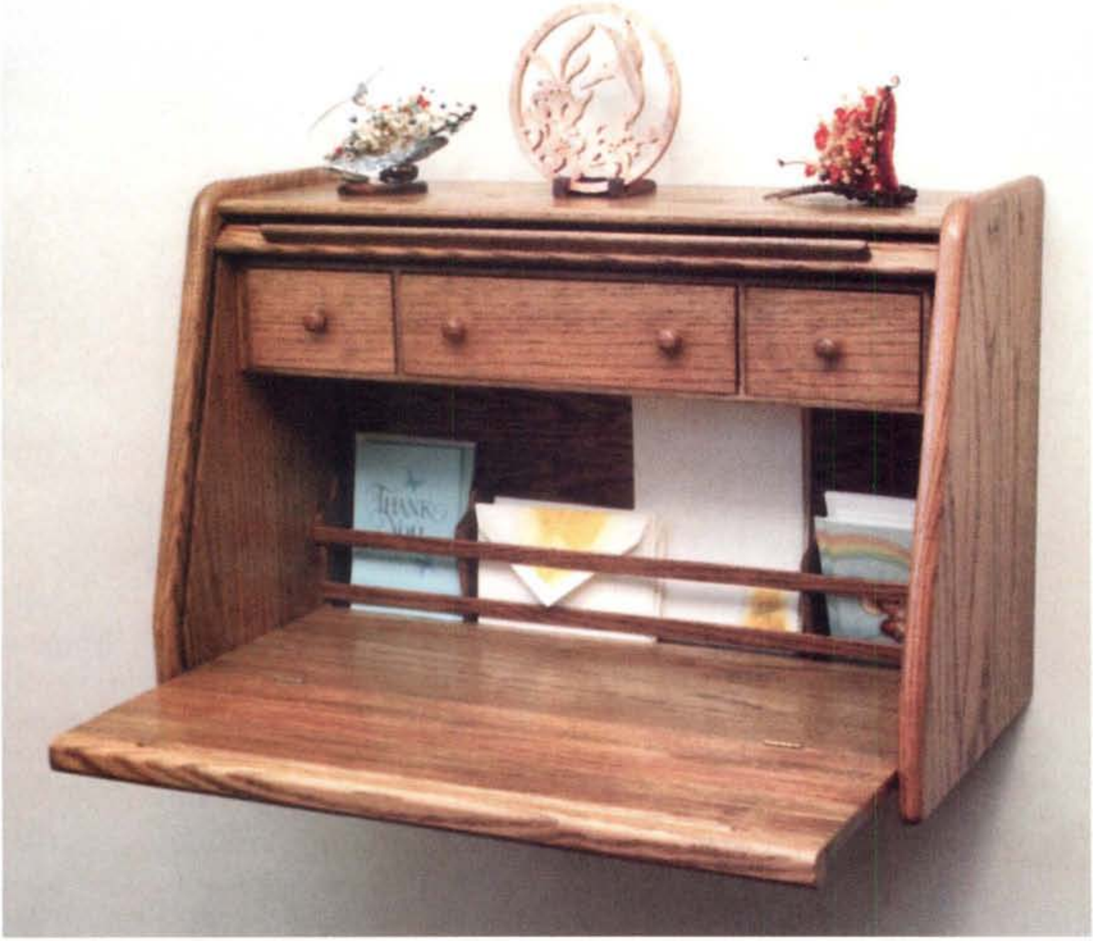
I used 3/4" cedar for the sides of the small tray. The corners are finger–jointed and glued. The bottom is 3/8" tongue and groove paneling let into a 3/8" groove which is dadoed 3/16" deep, 1/4" up on all four lower edges. Lightly glue the tongue and groove joints and assemble. Cut a rabbet in the finishing cap to accept lugs attached to the top of the tray.

This design has 3" by 3" corner posts made from 3/4" stock butted and doweled at right angles to each other. The front, back and end panels are glued and screwed to the inside of the corner posts. The short legs extending below the shell are filled to form solid feet 3" X 3". Plastic slides were then centered and attached on the bottom of the feet.

Instead of the spring balanced lid keeper used on the first chest, I used table leg support hinges, available in left and right–hand versions. Any center brace or other bulky configuration will interfere with the sliding tray. The pair of braces at each end are fairly low profile and don't extend too far into the chest area. You might also use traditional tray–lifting arms which raise and lower a full–width tray as the lid is opened and closed. PW



Tambour Wall Desk



by Bob Colpetzer

Every home seems to have an area where a writing surface is needed. The trouble is finding a space large enough to accommodate even the most compact desk.

Faced with this need at home, I designed and built a small wall mounted desk for use in the kitchen. The desk takes up very little space and quickly hides away when not in use. Best of all, my wife and I no longer have grocery lists, coupons, telephone messages, and recipe cards scattered all over the kitchen table.

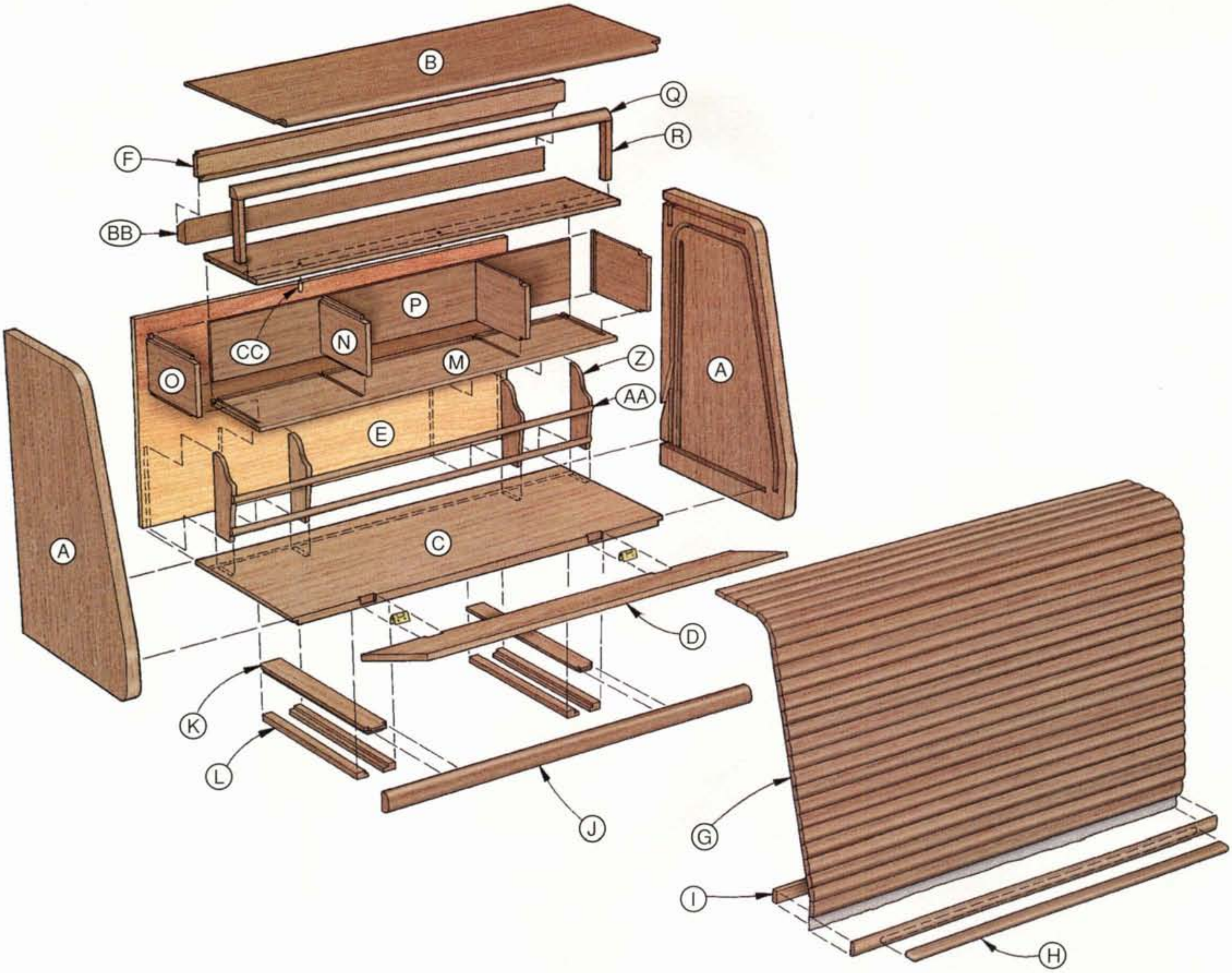
Begin construction of your tambour wall desk by roughing out enough stock to make two glue–ups for the sides (A). Make the glue–ups oversized and cut them down to the finished size given in the Cutting List. The sides must be structurally stable, so it's best to make them from narrow strips, not more than 3" wide, alternating the annual rings of adjacent pieces. This prevents the natural tendency of the wood to cup like it prone to in wider glue–ups.

Bob Colpetzer *is a woodworker and frequent contributor to* Popular Woodworking *from Clinton, Tennessee.*

Once the stock for the sides is glued and clamped set them aside and rough–out the stock for the top (B) and bottom (C) shelves and the extension leaf (D). As with the sides, glue–up these parts from narrow boards and reverse the annual rings of the adjacent pieces. Allow sufficient material to mill and square to the finished sizes.

While waiting for the glue–ups to dry, make a routing jig for the tambour groove. Make the jig from a piece of 3/8" plywood 9 5/16" wide X 14 7/16" long, see page 38, top figure. Notice that the jig has a 15° taper cut on one edge. The edge should measure 6 3/16" at the top and the angle should exit the edge 2 7/8" from the bottom. Cut the taper using a taper jig on the table saw, or use the bandsaw. Save the angled cut off from the routing template, it will be used later in the construction. To complete the jig, radius the corners and drill the mounting holes where located on the template profile.

The glue–ups for the sides should be dry by now so they can be unclamped. Scrape off the excess glue and mill to a finished thickness of 3/4". Rip the pieces to a width of 11 1/4" and cut them to a length of 16". Using a 15° taper jig, cut the

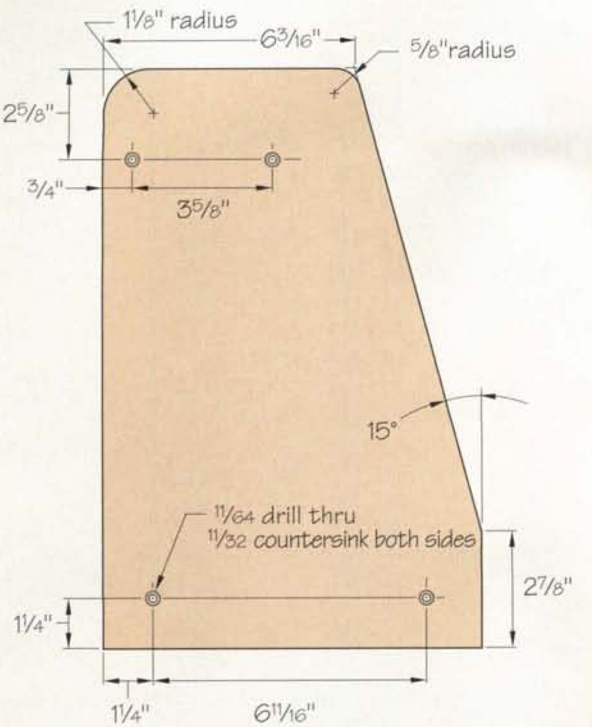


front edge of each side so that the top measures 7¾" and the taper exits the edge 3" from the bottom.

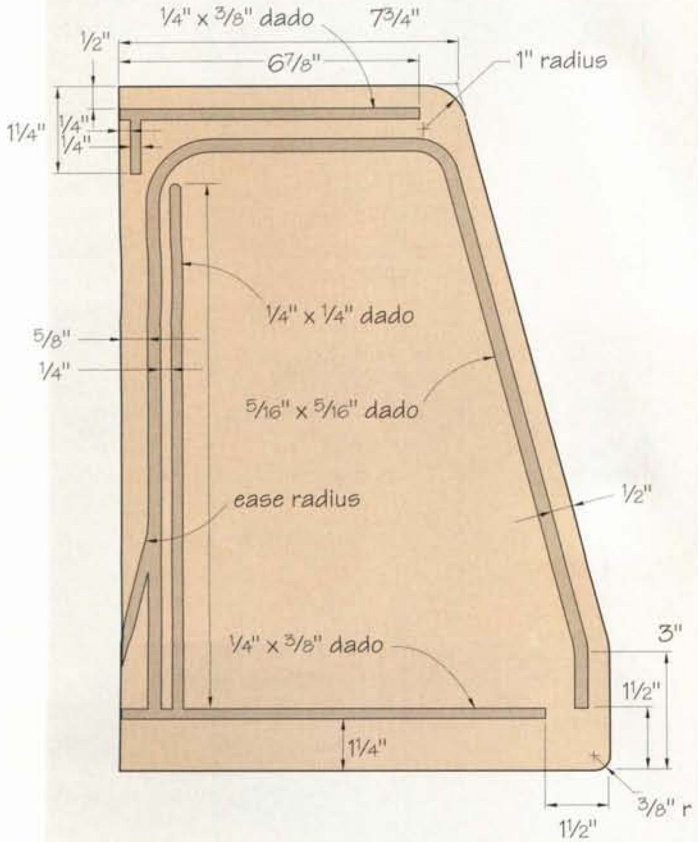
Before attaching the routing template, layout the position of the tambour groove and the top and bottom dadoes on the inside face of the left and right sides, shown the side figure on page 38. Attach the routing template to one side with #8 X ¾" FH screws. Make sure the bottom of the template is flush with the bottom of the side and the back edge of the template is 1" from the back edge of the side. Set up your router with a ½" OD guide bushing and a 5⁄16" diameter straight bit set to cut 5⁄16" deep. Route the tambour groove. A plunge router works best for this operation, but if you don't have access to one a standard router will work. To use a standard router, drill a 5⁄16" hole 5⁄16" deep as a starting hole and position the router in place before turning it on. Make sure the router bit is centered in the starting hole before sending the cutter spinning.

Before removing the template, attach the angle cut–off from the routing template and route the tambour escape groove, shown in the side figure. Remove the routing tem-

Install the assembled tambour through the angled escape groove. Sand the tambour strip ends to achieve a smooth fit.



side routing template



side

plate, flip it over and attach it to the opposite desk side. Follow the above procedure for routing the groove and escape groove on this side. When complete, remove the tambour routing jig.

Install a ¼" diameter straight bit set for ⅜" deep and an edge guide to the router. Adjust the edge guide so that the bottom dado can be routed. Once routed on the left and right sides, readjust the edge guide to cut the top shelf dado. Again, adjust the edge guide as necessary to route the groove for the hanging bracket. Readjust the depth of the ¼"

Tambour Wall Desk					
Cutting List					
		Finished Size			
Qty	**Part**	**T**	**W**	**L**	**Piece**
2	A	¾"	11¼"	16"	sides
1	B	½"	7⅜"	23¼"	top shelf
1	C	½"	10¼"	23¼"	bottom shelf
1	D	½"	6"	22 7/16"	extension leaf
1	E	¼"	12½"	23"	false back
1	F	½"	1¾"	23¼"	hanging bracket
26	G	¼"	¾"	23"	tambour strips
1	H	⅜"	⅞"	20"	tambour lift bar
1	I	⅛"	¾"	22⅜"	backing strip
1	J	¾"	1"	22 7/16"	extension pull bar
2	K	½"	1¼"	10¾"	extension runners
4	L	½"	⅞"	10¼"	extension guides
2	M	¼"	5⅝"	21¾"	drawer box t & b
2	N	¼"	5⅜"	3¼"	dividers
2	O	¼"	5⅝"	3¼"	end dividers
1	P	¼"	3¼"	21½"	box back
1	Q	⅝"	⅝"	22½"	top trim
2	R	⅜"	⅜"	3½"	spacers
2	S	½"	2 15/16"	5 9/16"	small drawer fronts
6	T	¼"	2½"	5⅛"	drawer sides
2	U	¼"	2 15/16"	5 5/16"	drawer backs
2	V	⅛"	4⅞"	5 5/16"	drawer bottoms
1	W	½"	2 15/16"	9 7/16"	large drawer front
1	X	¼"	2 15/16"	9 3/16"	large drawer back
1	Y	⅛"	4⅞"	9 3/16"	large drawer bottom
4	Z	¼"	1⅞"	4⅝"	rack dividers
2	AA	⅛"	⅝"	22½"	rack fronts
1	BB	½"	1½"	22½"	wall hanging bracket
3	CC	¼" diam		¾"	drawer stops

straight bit to ¼" and route the groove for the false back. Complete the routing of the side grooves and dadoes by squaring the stopped ends of the dadoes with a chisel.

Plane the glue–ups for the shelves (B and C) and a piece of stock for the hanging bracket (F) to a finished thickness of ½". Rip them to width and cut them to their finished length. Use a stop block to ensure all parts are exactly the same length.

Install a ¼" dado blade on the table saw. Cut a ¼" X ¼" dado in the bottom face of the top shelf, ¼" from the back edge. Also, cut a ¼" X ¼" dado in the top face of the bottom shelf. These dados are for the false back and should align with the groove routed in the sides.

Cut ¼" X ⅜" rabbets on the ends of the shelves and hanging bracket to match the dadoes and grooves. Readjust the blade and fence setting and cut a ¼" X ¼" rabbet on the top edge of the hanging bracket. Cut a 45° bevel on the bottom inside edge of the hanging bracket. Cut out the ¼" plywood for the false back and round over the top edge. Dry assemble the parts and make any corrections needed. Layout the radius on the sides as shown on page 38. Cut and shape these smooth.

With a ⅜" radius roundover bit installed in your router, route the top, bottom, and front edges of the sides. The front edges of the top shelf can also be routed at this time but change to a ¼" radius roundover bit. Finish sand all parts before final assembly. Check for square and remove any excess glue before allowing the assembly to dry.

Rip the tambour strips (G) from ¾" thick X 24" long stock. Joint the edge of one side of the ¾" stock prior to ripping each ¼" strip. Thus, you should have 26 pieces, ¼" thick with one jointed face (front side) and a sawed face (back side).

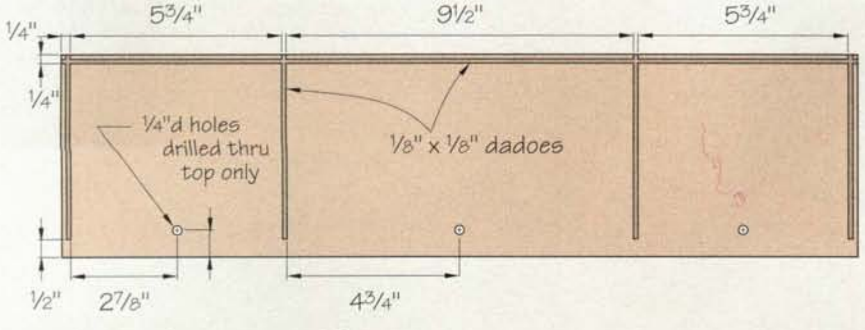
Using a router table or shaper, shape a 3/16" radius on the jointed edges of the strips. If a router table or shaper is not available, route the edges using a standard router and a 3/16" radius roundover bit, however, this proceedure should be done prior to ripping each strip. Finish sand the face and edges of all the strips.

Make the tambour clamping jig shown on page 40. Position the strips in the form, face side down, and draw them tight with bar clamps. Attach the keeper blocks and remove the bar clamps. Wash and dry the canvas before attaching it to the tambors. This pre–shrinks the canvas and eliminates the possibility of shrinkage that can occur from gluing. Spread an even coat of glue on the tambour strips. Apply the canvas, smoothing it out so there are no wrinkles.

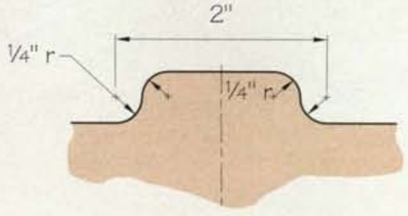
Whether cut by hand or with a router, half blind dovetails add strength and a show of craftsmanship to the drawers.

Position the top form on the canvas and add weight. Allow the assembly to dry over night.

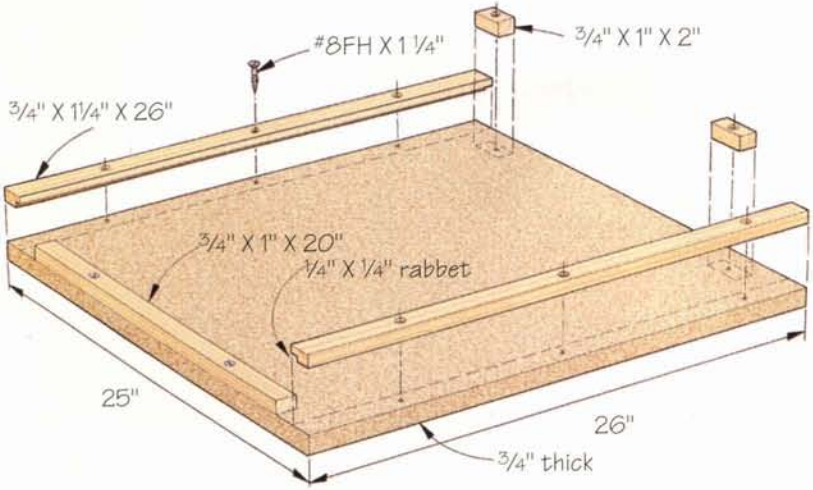
Once the tambour assembly is dry, trim each edge and cut to the finished length given in the Cutting List. Slide the tambour assembly into the tambour groove through the tambour escape groove. If the tambour unit catches or is snug, it may be necessary to widen or ease the radius of the escape groove or trim the thickness of the tambour ends that fit in the tambour groove. Once the tambour assembly slides freely, remove it. Make the tambour lift bar (H) and the backing strip (I) dimensioned in the Cutting List. With the tambour assembly removed, connect the lift bar to the lift bar tambour and backing strip. Note, the lift bar must be removed to install the tambour back into the desk. By pre–assembling the lift bar and then disassembling, the task of installing the lift bar to the tambour assembly is made easier once the tambour is in place in the groove. Drill and countersink holes through the backing strip and attach the tambour lift bar with four #6 X ⅞" FH woodscrews. The lift bar can be butted to the bottom tam-



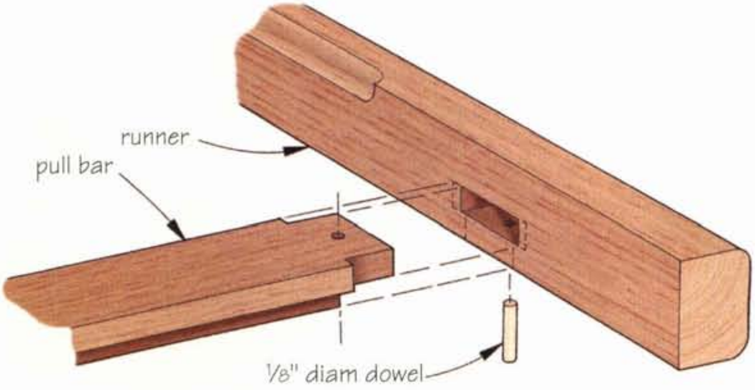
drawer box top and bottom



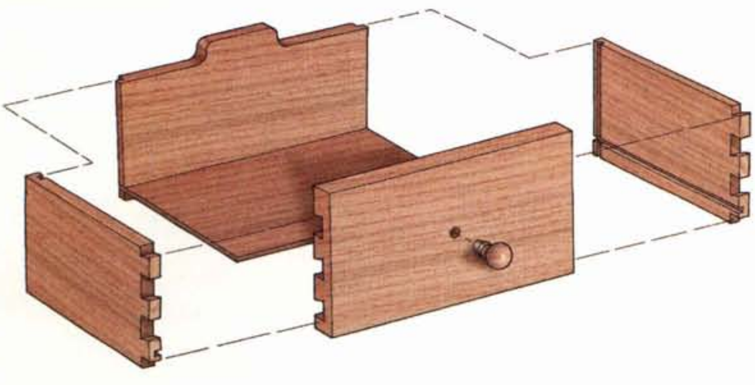
drawer back tab



tambour clamping jig



extension pull bar and runner



drawer detail

bour and attached with screws, or cut a tongue on the lift bar and a groove in the tambour strip then attach with screws. Do not glue the lift bar in place—it needs to be removed in order to install the tambour assembly.

Cut out the stock for the extension pull bar (J). When cutting the extension pull bar to finished length, cut the extension leaf (D) using the same stop. On the inside face of the extension pull bar cut two ¼" wide X ½" deep X 1" long mortises. Locate these 4½" from each end as shown in the middle Figure to the left. Route the front edges of the pull bar with a ⅜" radius bit.

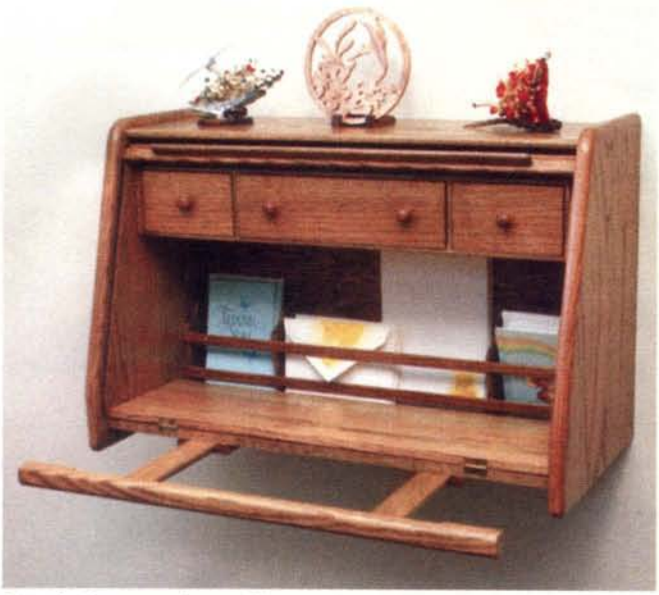
Cut the ½" stock for the extension runners and guides as dimensioned in the Cutting List. Cut ¼" X ¼" rabbets on the edges of the runners and guides as shown to the left. Cut a ½" wide X ¼" deep rabbet on one end of the runners to fit the mortise in the pull bar. Trim the shoulders of the tenons with a chisel. Finish sand the runners and the pull bar then glue and pin them together with a piece of ⅛" dowel. Trim the dowel flush to the bottom of the pull bar. Make sure that the runners are parallel to one another and square to the pull bar before allowing the glue to dry.

Use the runner and pull bar assembly as a positioning guide; then use #8 X ¾" FH wood screws to attach the four extension guides (I) to the underside of the bottom shelf. Leave 1/64" clearance between the runners and guides for smooth operation.

Cut hinge mortises in the leaf and bottom shelf and install 1" narrow brass butt hinges. To create the pencil groove, clamp the pull bar tightly to the leaf. Adjust the router edge guide then use a router with a ½" core box bit to route the pencil groove.

Use ¼" stock to make the drawer box. If this is not available it will be necessary to resaw ¾" stock. Mill this stock with the same fence setups to ensure consistency of size and save time on machine set–up. Once the ¼" stock has been prepared, cut out the top and bottom (M), dividers (N), ends (O), and back (P) to the finished dimensions given in the Cutting List. Set up and cut the ⅛" X ⅛" dadoes on the inside face of the top and bottom, shown on page 39. I prefer cutting these as stoped dadoes so the cut isn't visible from the front. Without changing the set–up, cut the groove for the back on the inside back edge of the top, bottom, and end parts of the drawer box. Cut the rabbets on the ends of the sides and dividers, as well as the ends and edges of the back, to match the grooves and dadoes. After cutting the notches to allow for the stoped dadoes, a trial assembly is in order.

Route the pencil groove so that half the profile is in the extension leaf, and half is in the pull bar.



Attach the extension pull bar to the runners, then position the runner guides accodingly. The runners support the extension leaf which adds to the area of the work space.

The desk is held securely to the wall with mating 45° bevels on the bracket and desk. Secure the bracket to the wall studs with #14 X 3" screws.

Once a proper fit has been obtained, sand the parts and drill holes for the drawer stops (CC); then glue and clamp the assembly. Once dry, the top trim (Q) and side spacers (R) are glued to the box.

Position the drawer box in the desk. Scribe and cut the side spacers to obtain a tight fit. The bottom of the drawer box should be 8⅝" above the top of the bottom desk shelf. Check the tambour clearance before attaching the box to the sides of the desk. Attach the box to the sides with #6 X 1" FH wood screws and use #4 X ⅜" FH wood screws to attach the sides to the false back.

Cut out the drawer fronts from ½" stock. Cut the backs and sides to the drawers from ¼" stock as dimensioned in the Cutting List. Layout and cut the dovetails in the drawer fronts and sides. Make the rabbet/dado ⅛" wide X ⅛" deep to join the backs and sides. Cut a ⅛" X ⅛" groove for the drawer bottom located ¼" from bottom edge. On the drawer backs, layout and cut the shape of the drawer stop, as shown in the bottom right Figure on page 39. Sand all the parts before gluing them together. Turn you own drawer knobs or purchase wooden or brass knobs from a retail outlet.

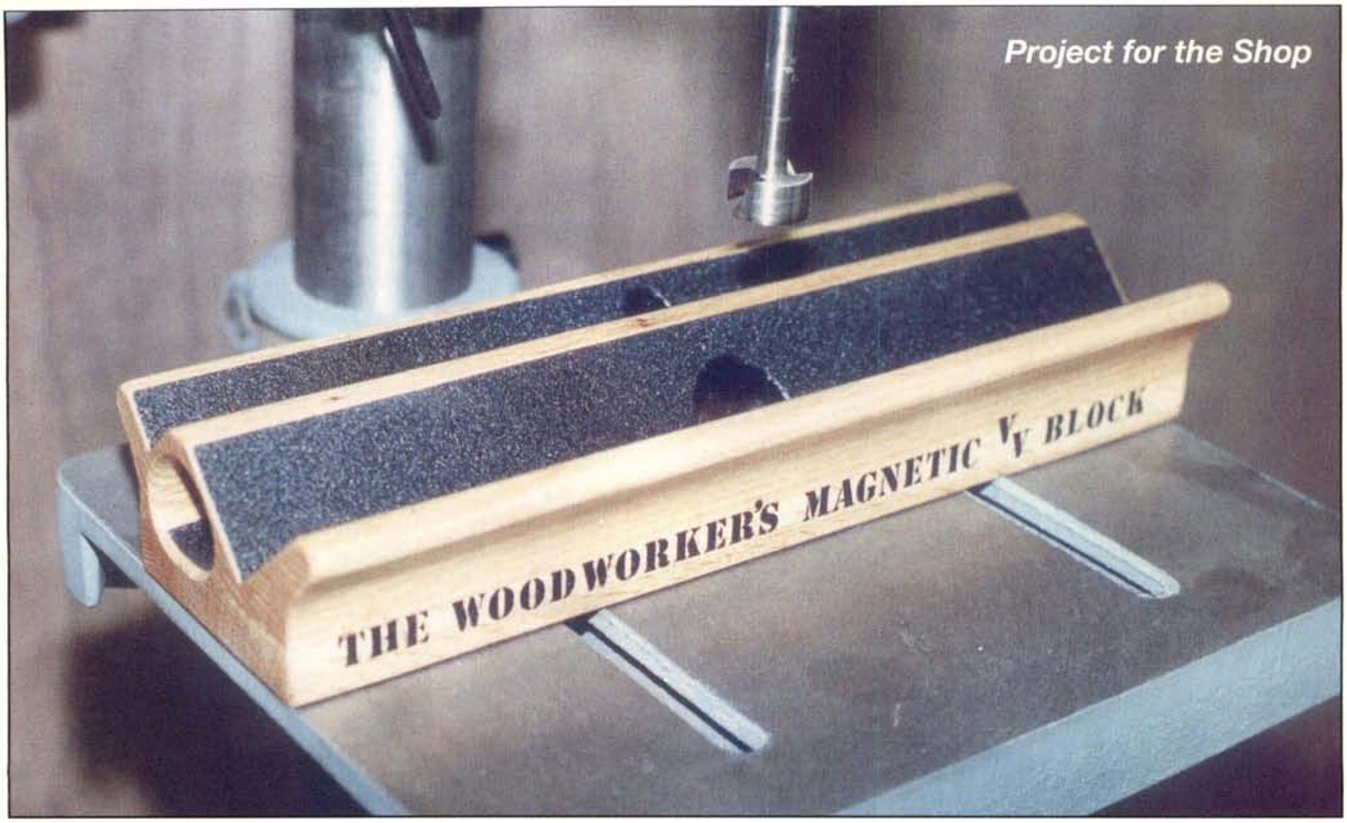
Cut the four dividers (AA) for the stationary rack from the remaining ¼" stock. The pattern for the top shape is given in the PullOut™ Plans. Cut two ⅛" X ⅝" X 22½" strips for the front bars of the stationary rack. After sanding all the parts, attach the bars to the dividers with glue and ½" brads. Attach the stationary rack assembly in the desk by using #4 X ⅝" FH screws through the false back. For fastening the desk to the wall, cut out a ½" X 1½" X 22½" piece of stock with a 45° bevel on one edge to match that of the hanging bracket on the cabinet. The desk may be disassembled now for finishing. Take out the tambour, drawers, drawer box, and stationary rack. Also, remove the extension assembly and the hinges from the extension leaf.

Check the entire project for glue stains and any parts that may need sanding touch–up, then apply your favorite stain.

Once the stain has dried, apply one coat of sanding sealer and two coats of satin varnish to all the parts. Remember to scuff sand with 400–grit wet/dry paper between coats.

Prior to final assembly, rub out the final finish with very fine (0000) steel wool and apply a good paste wax. Reassemble the extension leaf, stationary rack, drawer box, extension bar and tambour. Rub paraffin on the extension guides, tambour groove, ends of the tambour and the drawer bottom edges to make the parts slide smoothly.

To mount the desk to the wall fasten the wall hanging bracket to the wall using 3" FH screws. Make sure the screws are positioned and driven into the studs within the wall. Also, take care to measure and level the bracket so that the desk is level and the writing is at the proper height. PW

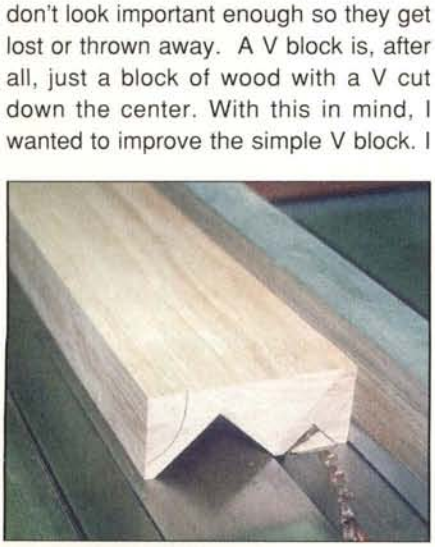


The Woodworker's

Magnetic V Block

by Dick Dorn

I've made dozens of V blocks for my high school woodworking classes. Yet every time we need one they are nowhere to be found. Apparently, they don't look important enough so they get lost or thrown away. A V block is, after all, just a block of wood with a V cut down the center. With this in mind, I wanted to improve the simple V block. I felt that if it looked sharp it would stay around, and if it worked well it would get used.



Cutting the V shaped grooves is done on the table saw with the blade set at 45°.

In my design I've incorporated a number of improvements over the traditional V blocks you often see. The top surface has two parallel full length Vs. One V is large and the other is small, so to accommodate various sizes of work. Both Vs are lined with anti–skid tape to help prevent the work from turning or sliding. Two recessed areas are vertically drilled near the center of each V enabling you to drill completely through the work without damaging the block. Two recessed clamp seats are drilled horizontally into each end of the block. Clamps, if needed, are always situated below the work surface of the Vs. The bottom surface of the block is magnetic. Several magnets are embedded flush with the bottom to steady the block during most drilling operations. Anti–skid tape covers the bottom of the block to seal and protect the magnets and keep it from sliding. Coved hand grips along the edges make it easy to handle, and remove from metal surfaces.

Shaping the V Block

Stack and glue together three ¾" X 6" boards that are 1" longer than the work surface of your drill press. I used oak because it is heavy, strong, and doesn't easily dent. Square one edge of your blank on the jointer. Set the fence on the table saw to 5½" and rip the other edge. Square both ends. Transfer the full size end pattern given in the PullOut™ Plans to one end of the laminated block.

Cut the two parallel Vs with your table saw set to 45°. Use the pattern drawn on the end of the block as a guide to adjust the blade height and the rip fence. Four separate adjustments

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***Dick Dorn** is a contributing editor to* Popular Woodworking. *He teaches high school shop in Oelwein, Iowa.*

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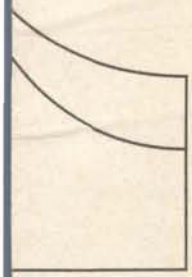
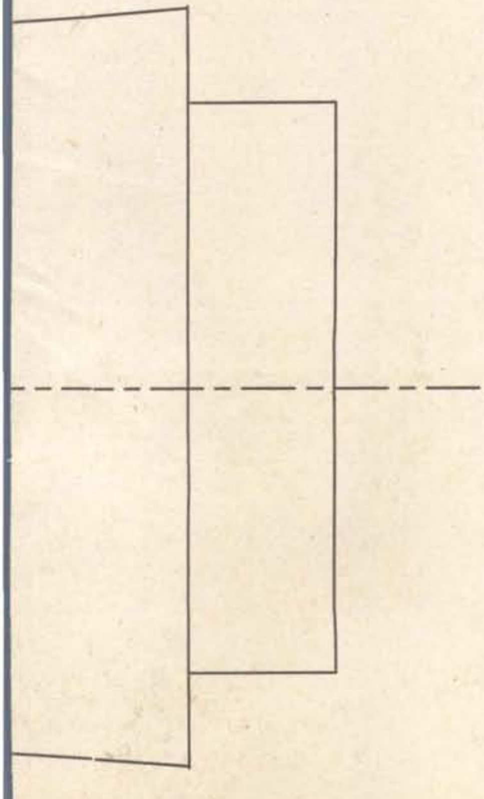
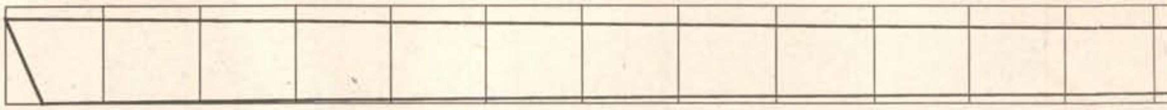
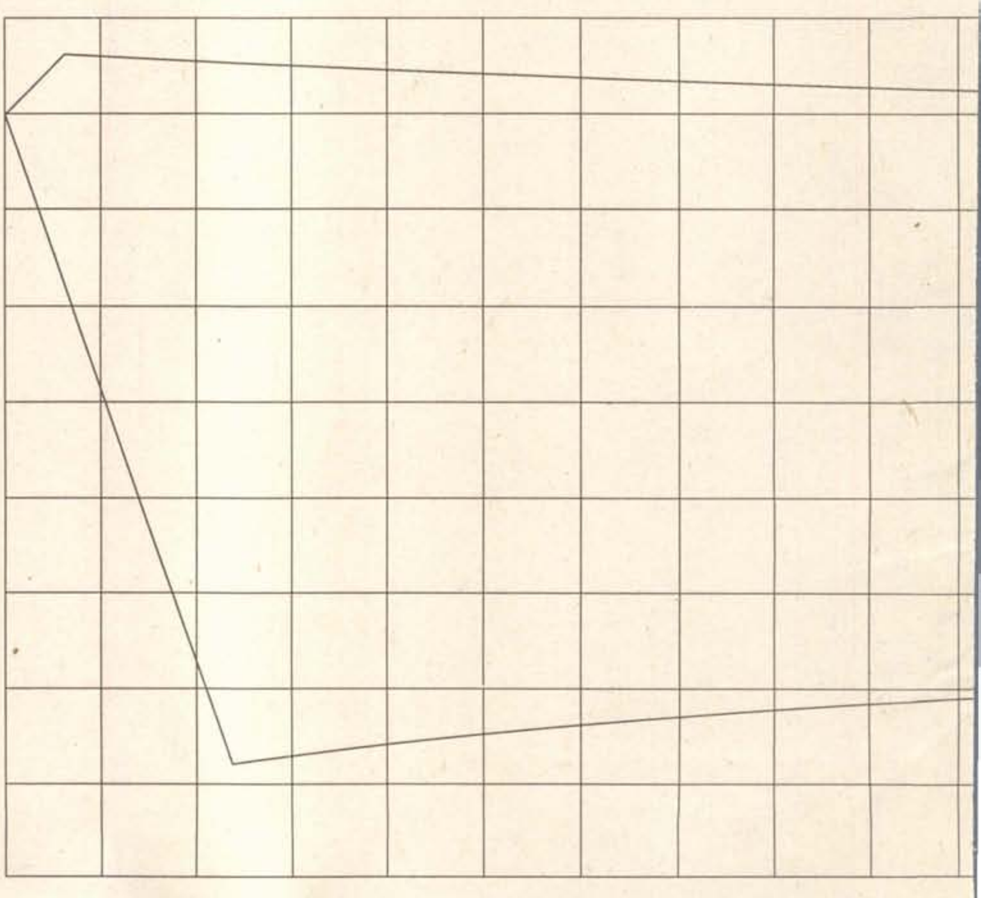
May 1994 (pages 43-58)

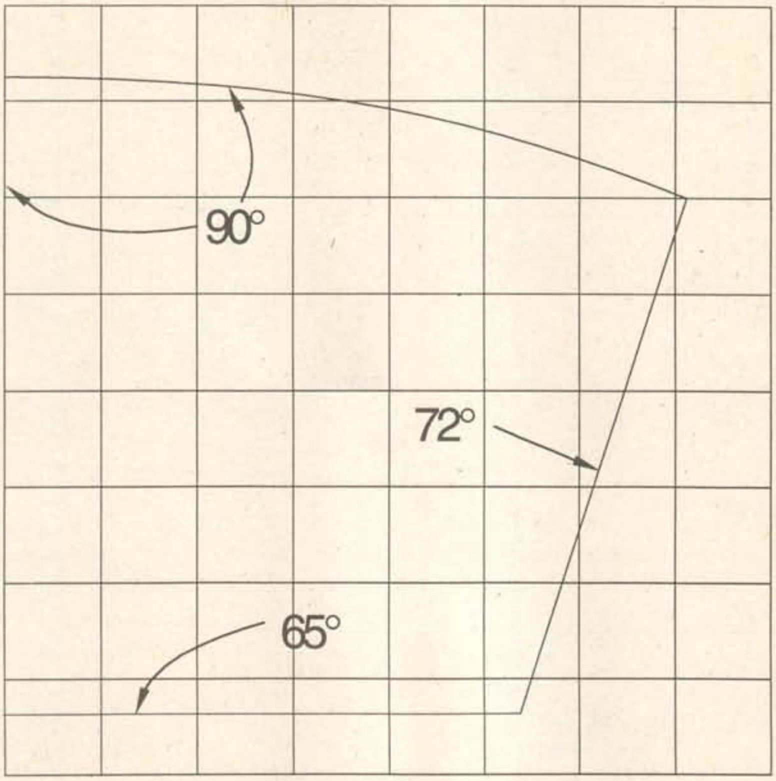
PullOut™ Plans







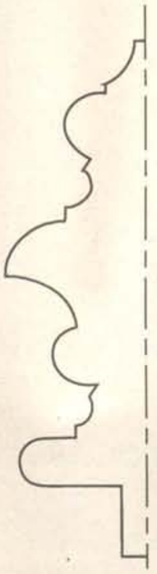




Nautical Flower Box

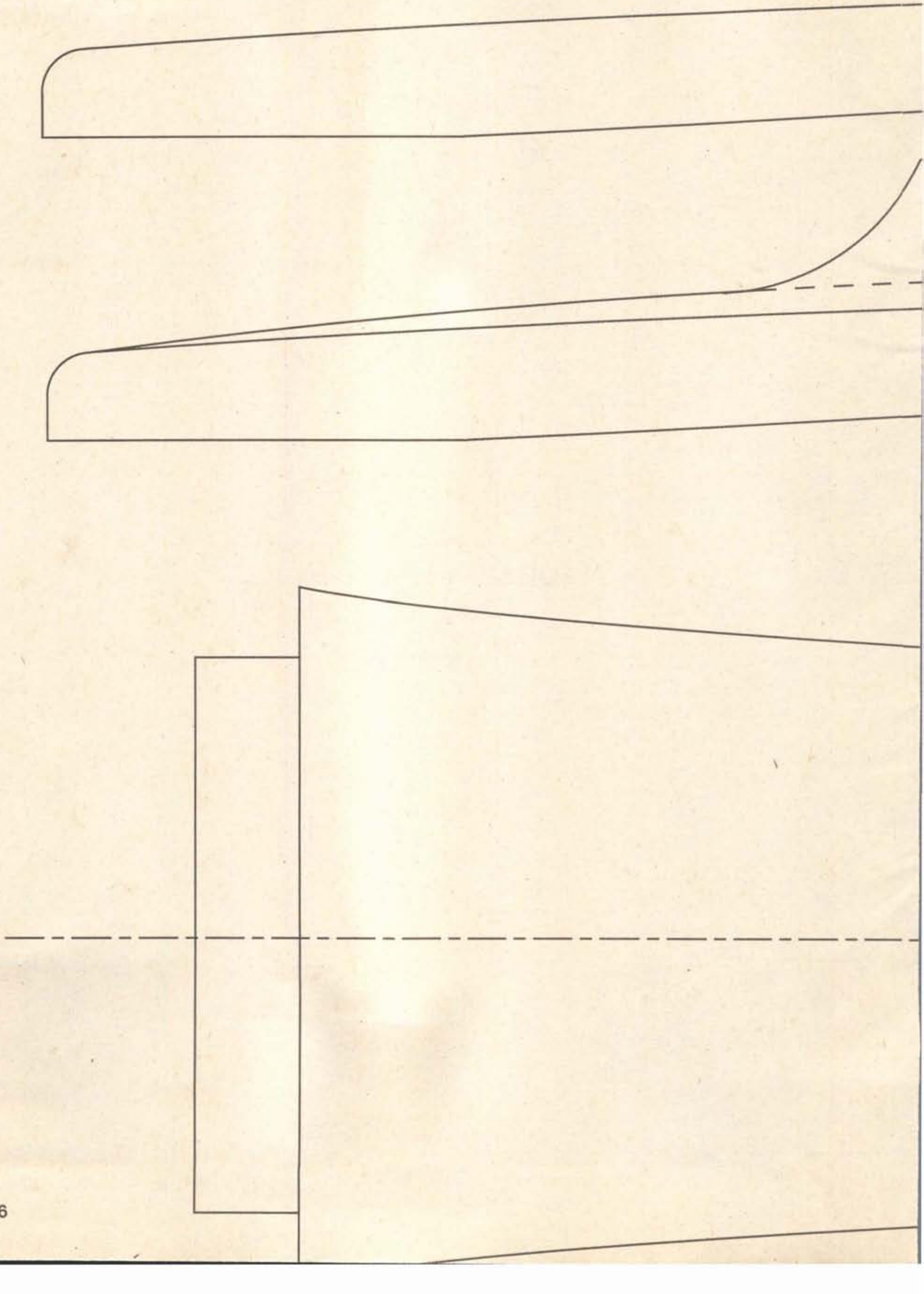
Ⓒ

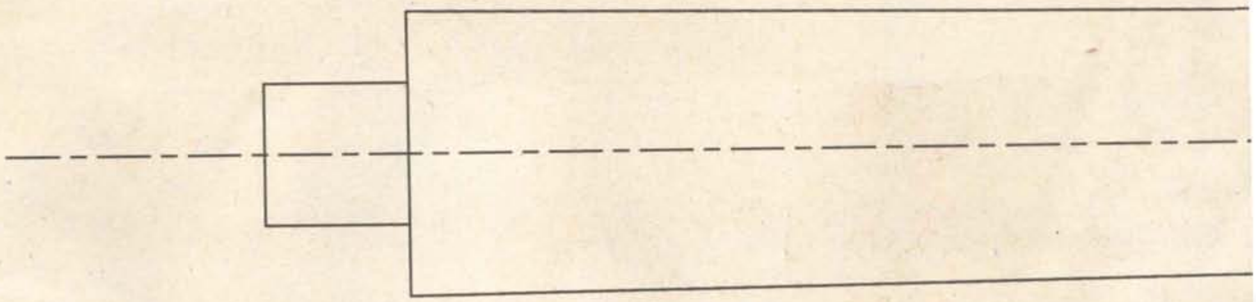
stem

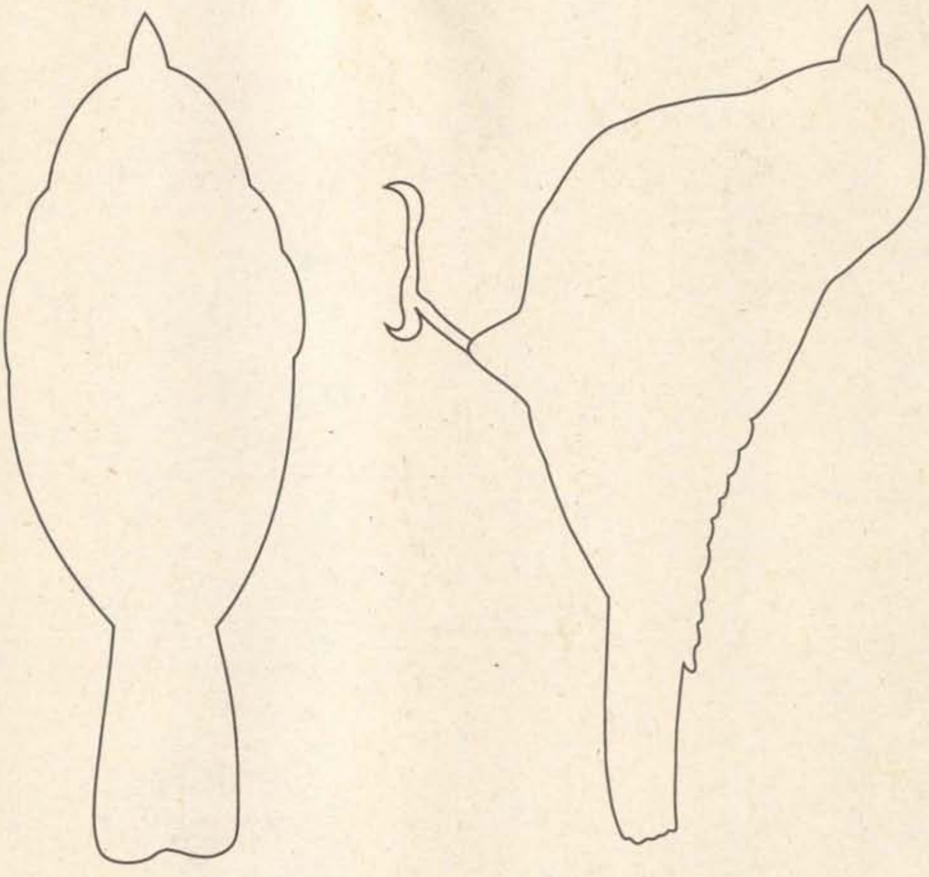


Canister

finial pattern

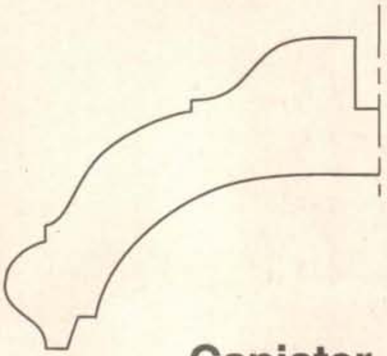




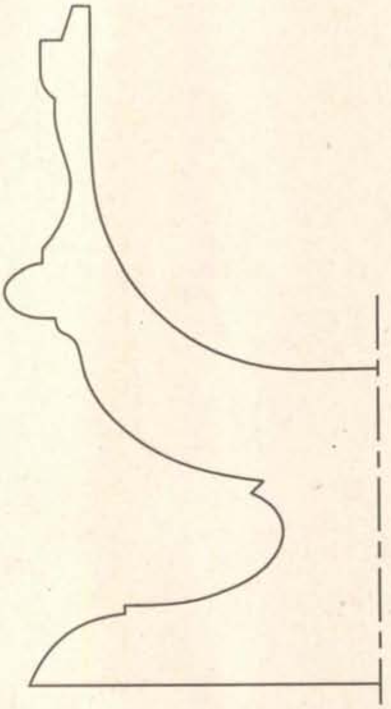


Chickadee

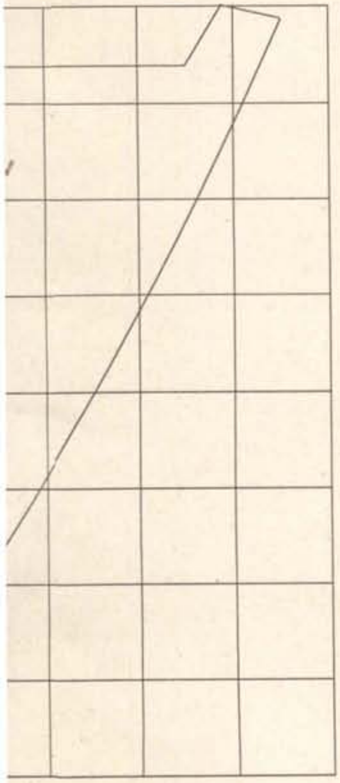
carving pattern

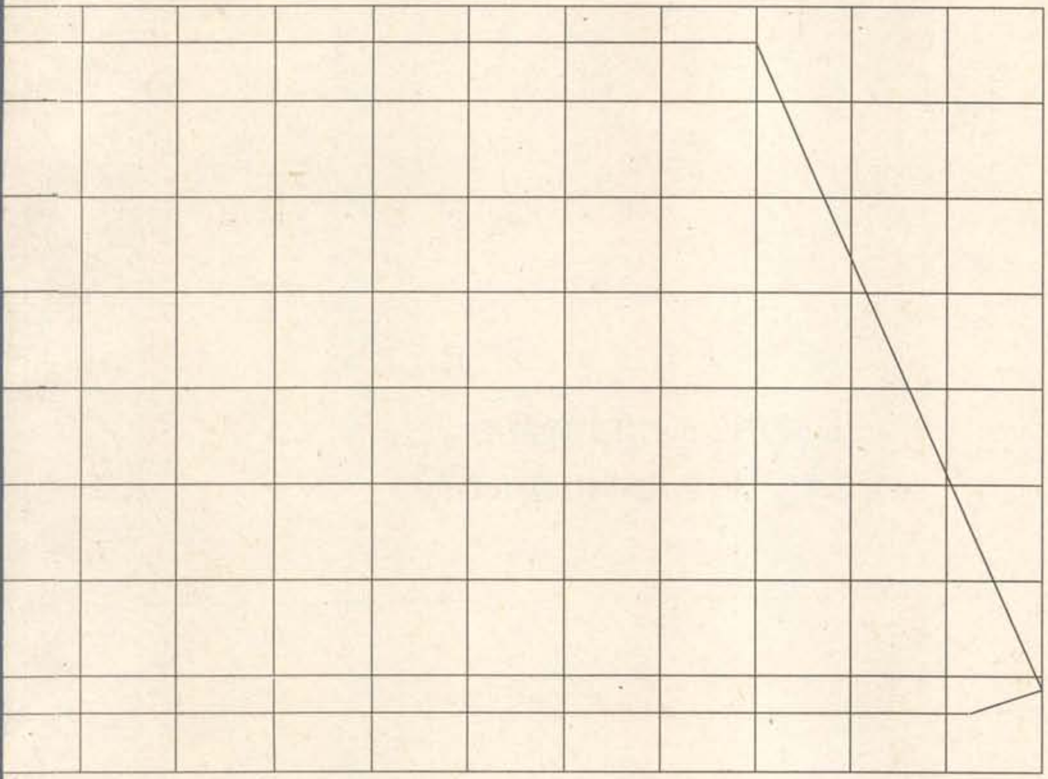


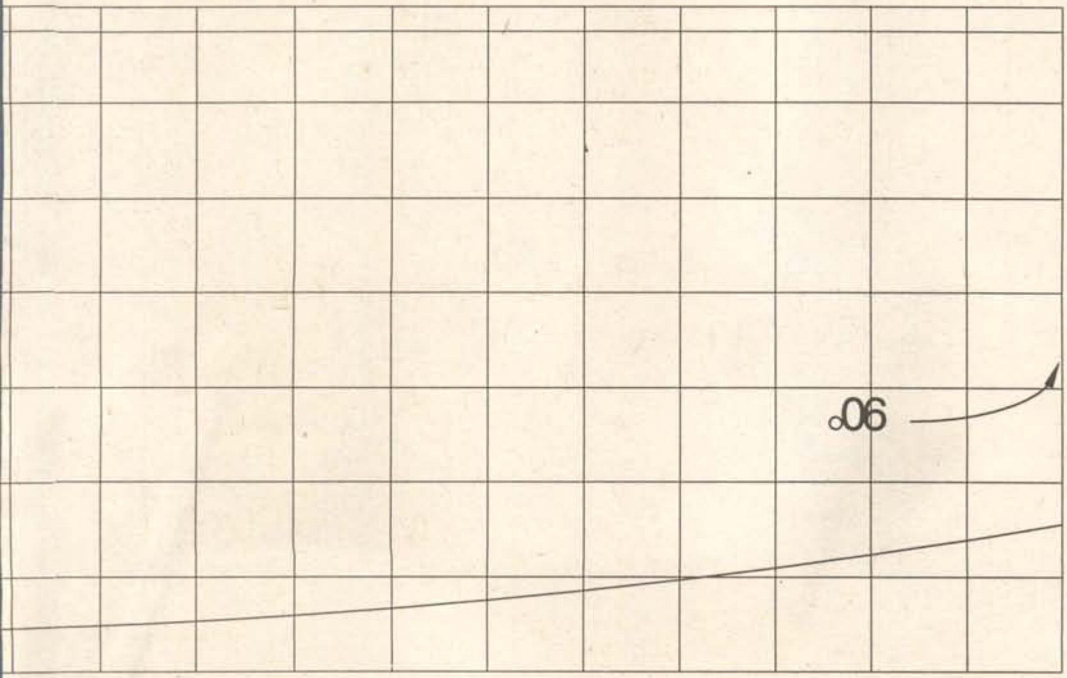
Canister
cover pattern

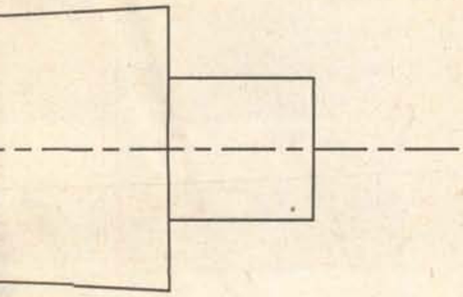


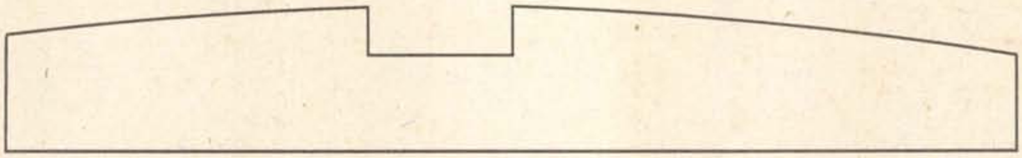
Canister
body pattern



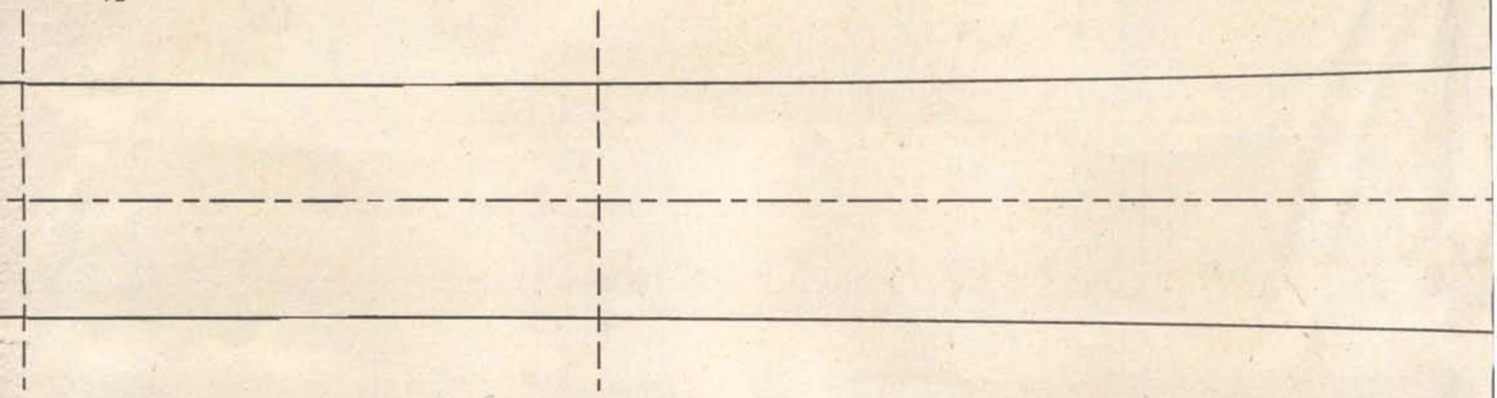


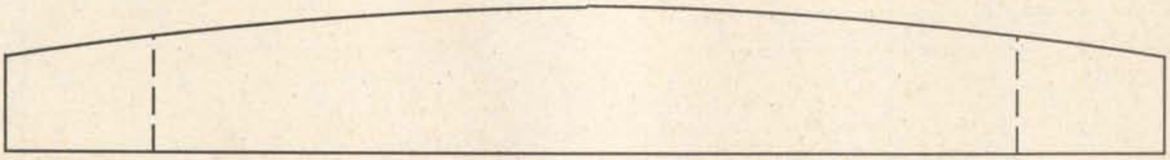

90°



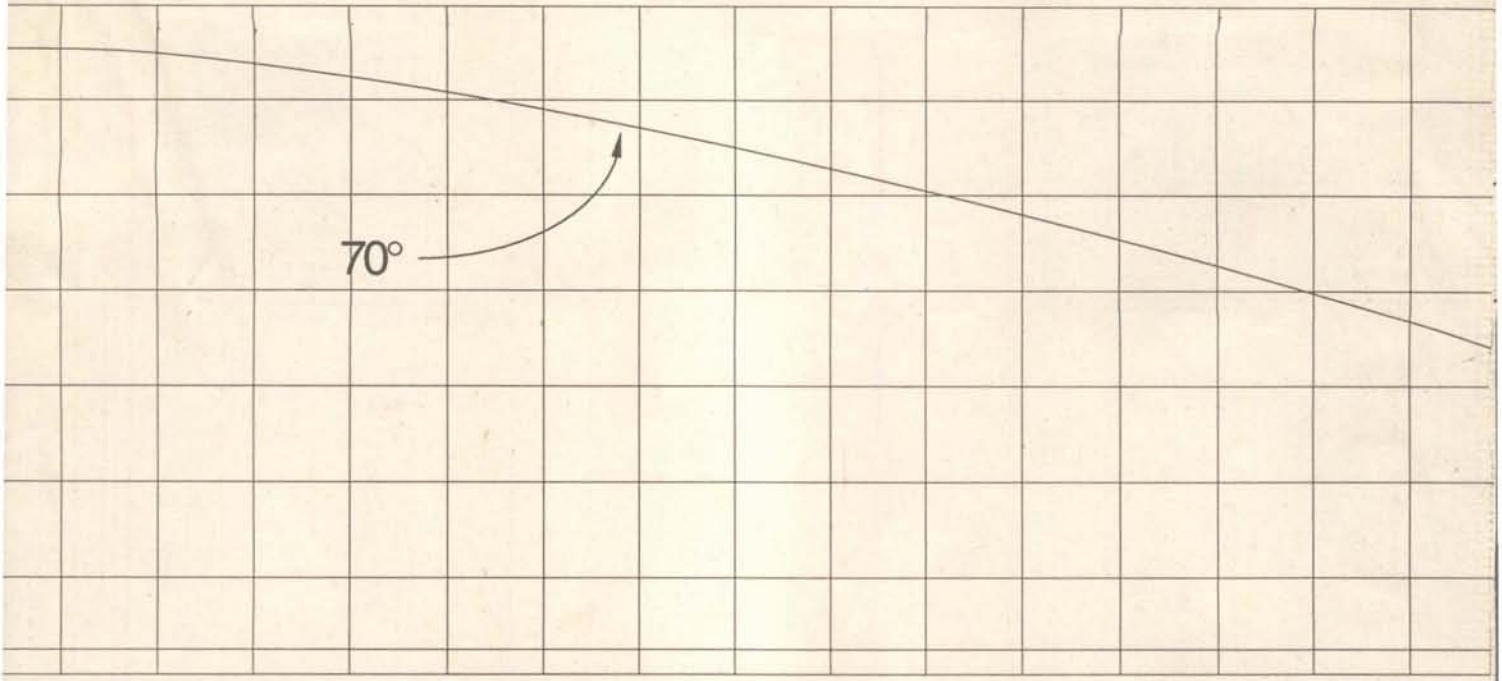


Contemporary Desk
drawer front pattern





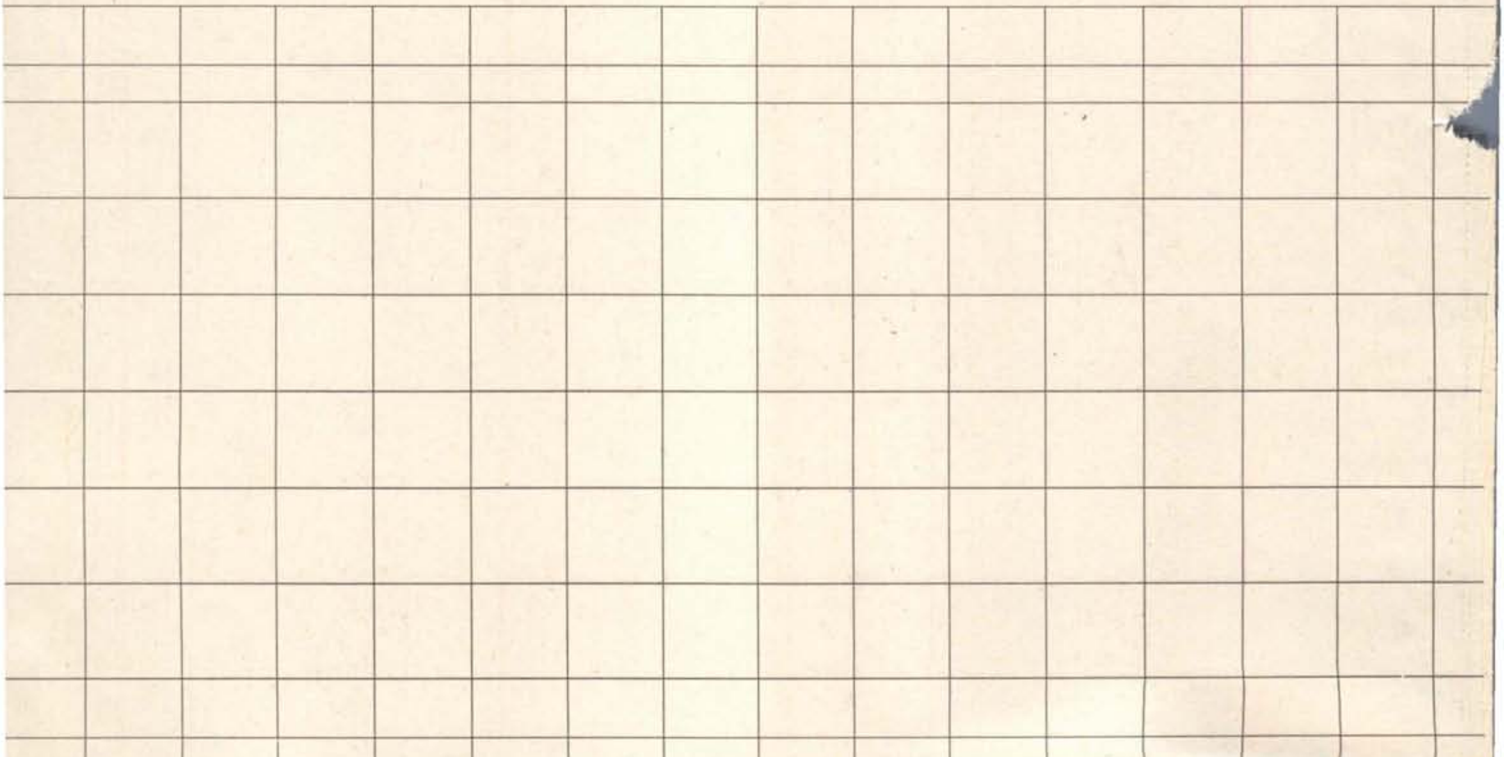
Contemporary Desk
side profile



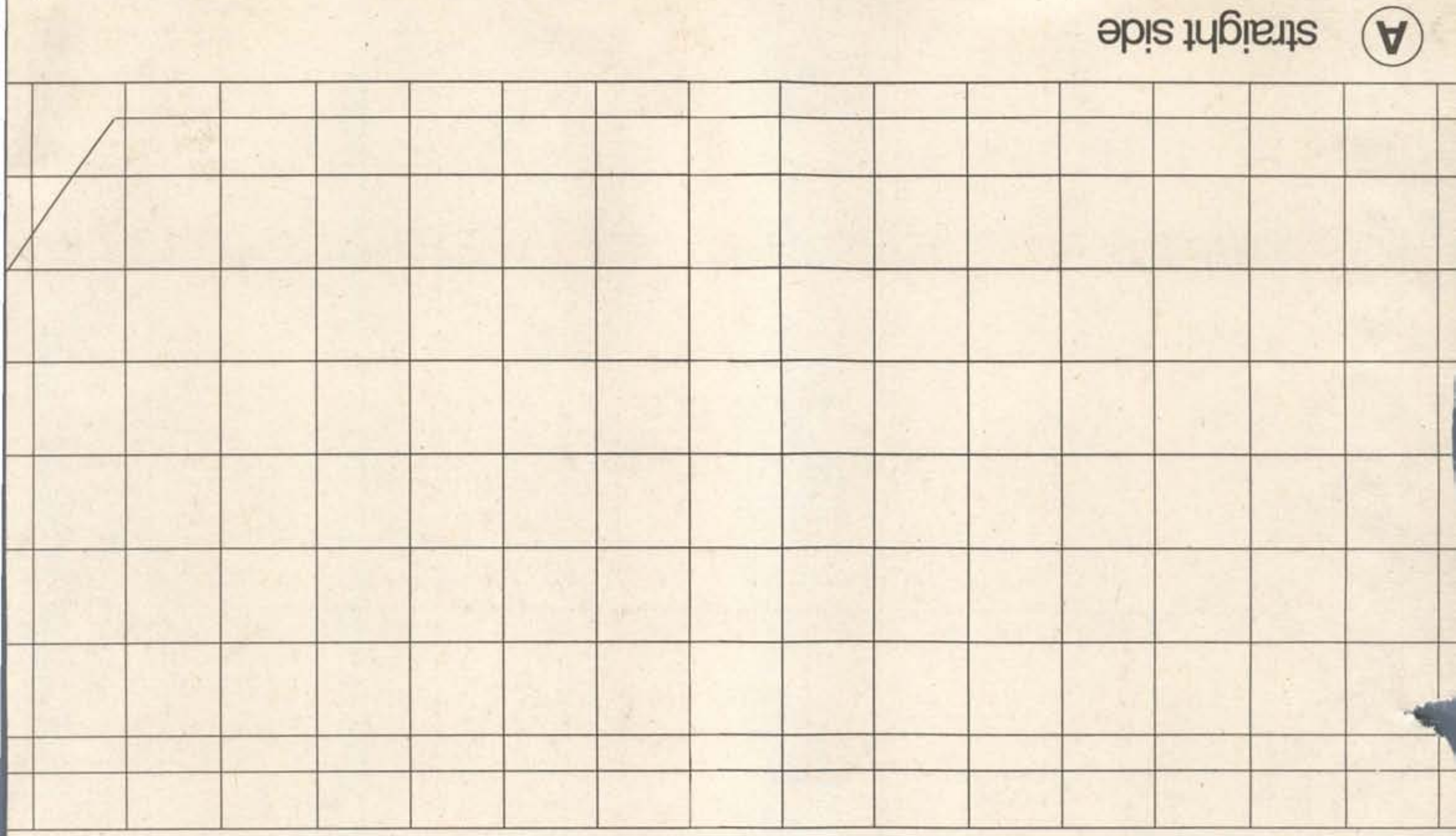
Nautical Flower Box

Ⓑ

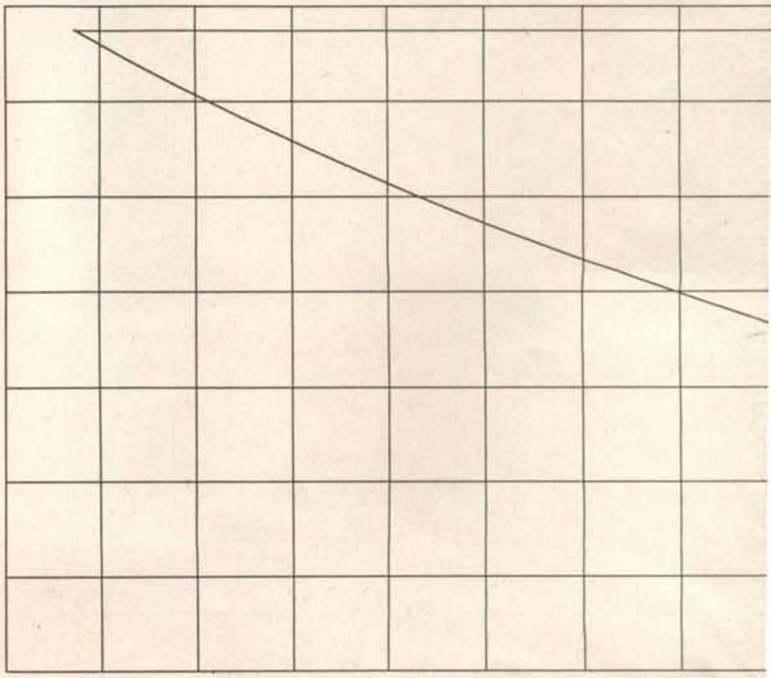
bottom



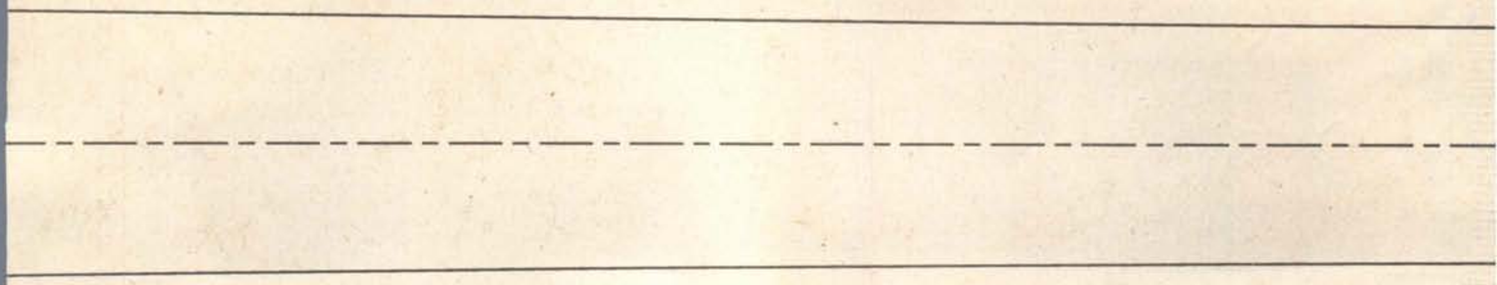
Nautical Flower Box

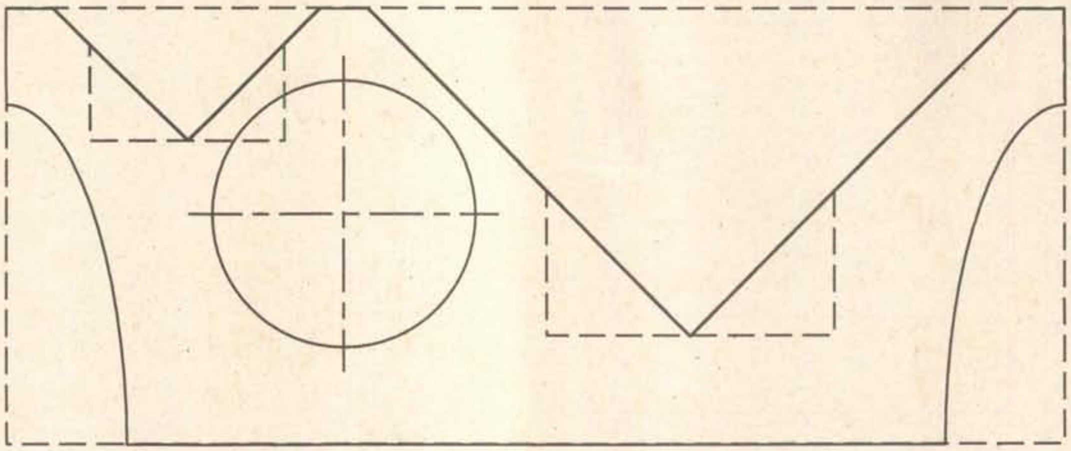


Ⓐ straight side

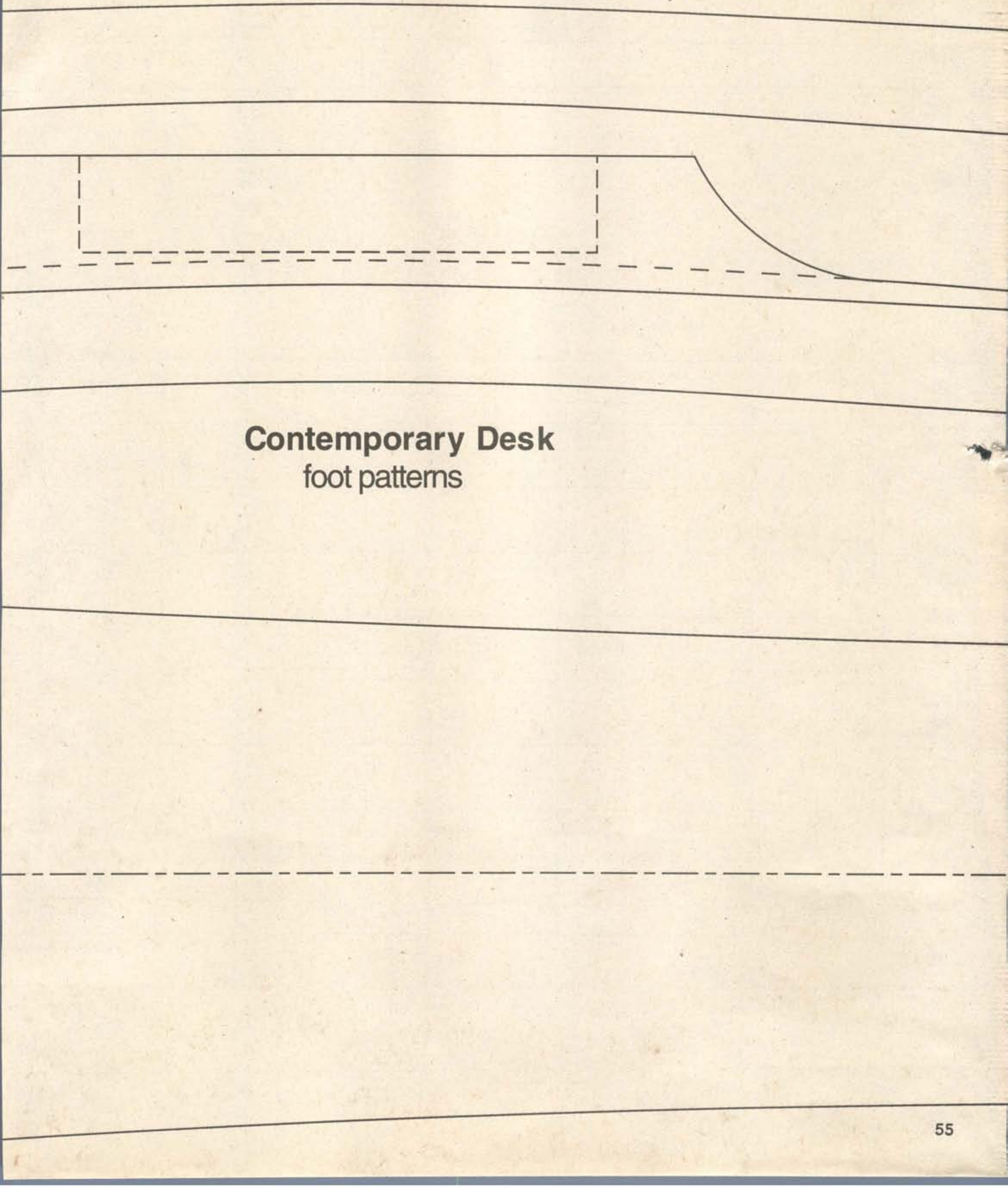


Contemporary Desk
leg patterns



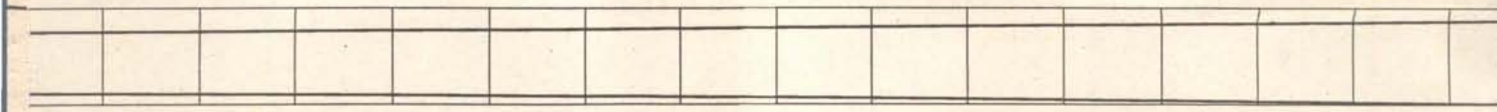


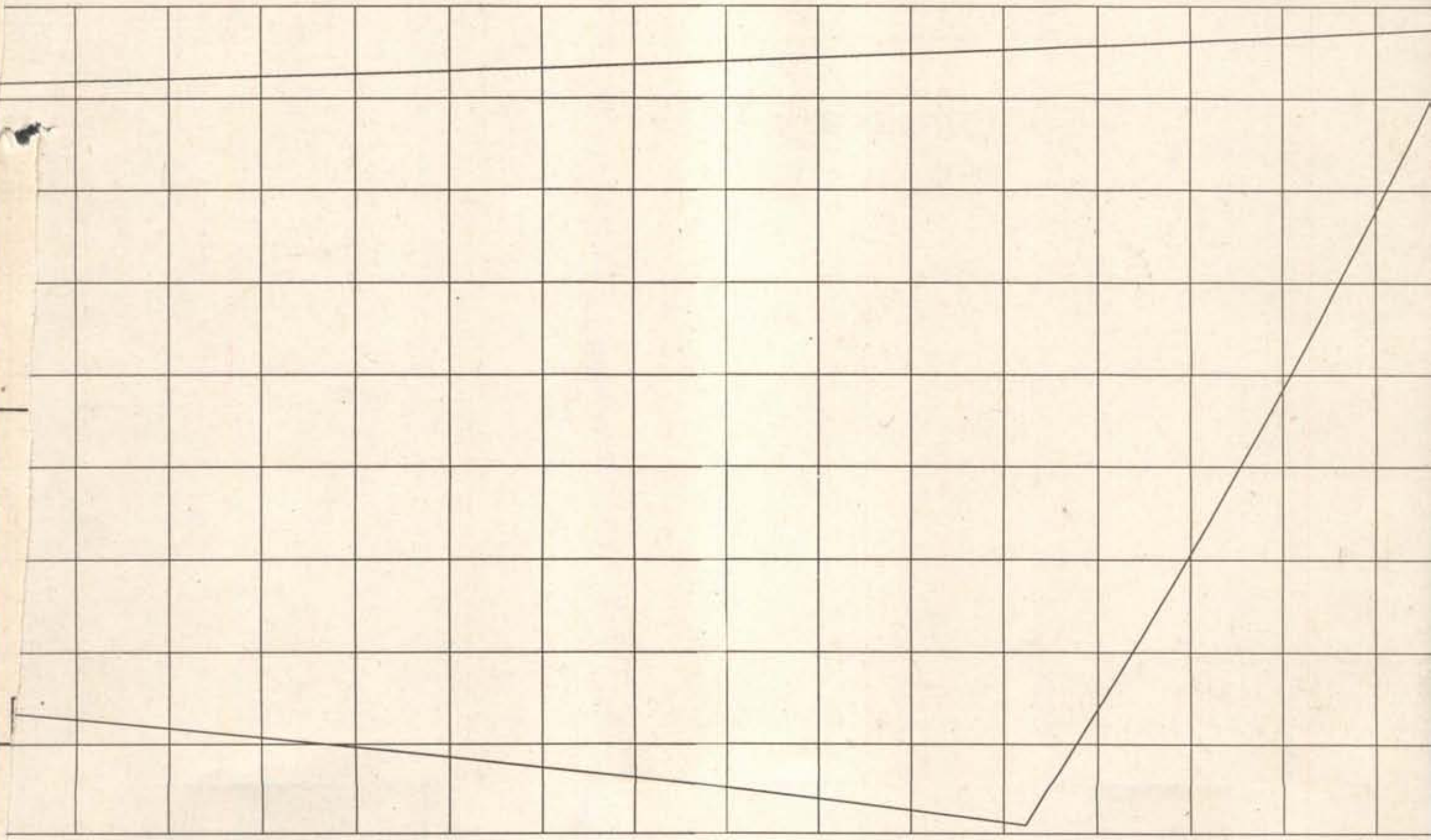
Magnetic V Block
end profile

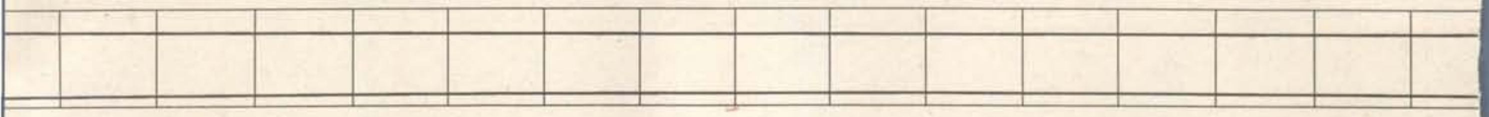


Contemporary Desk

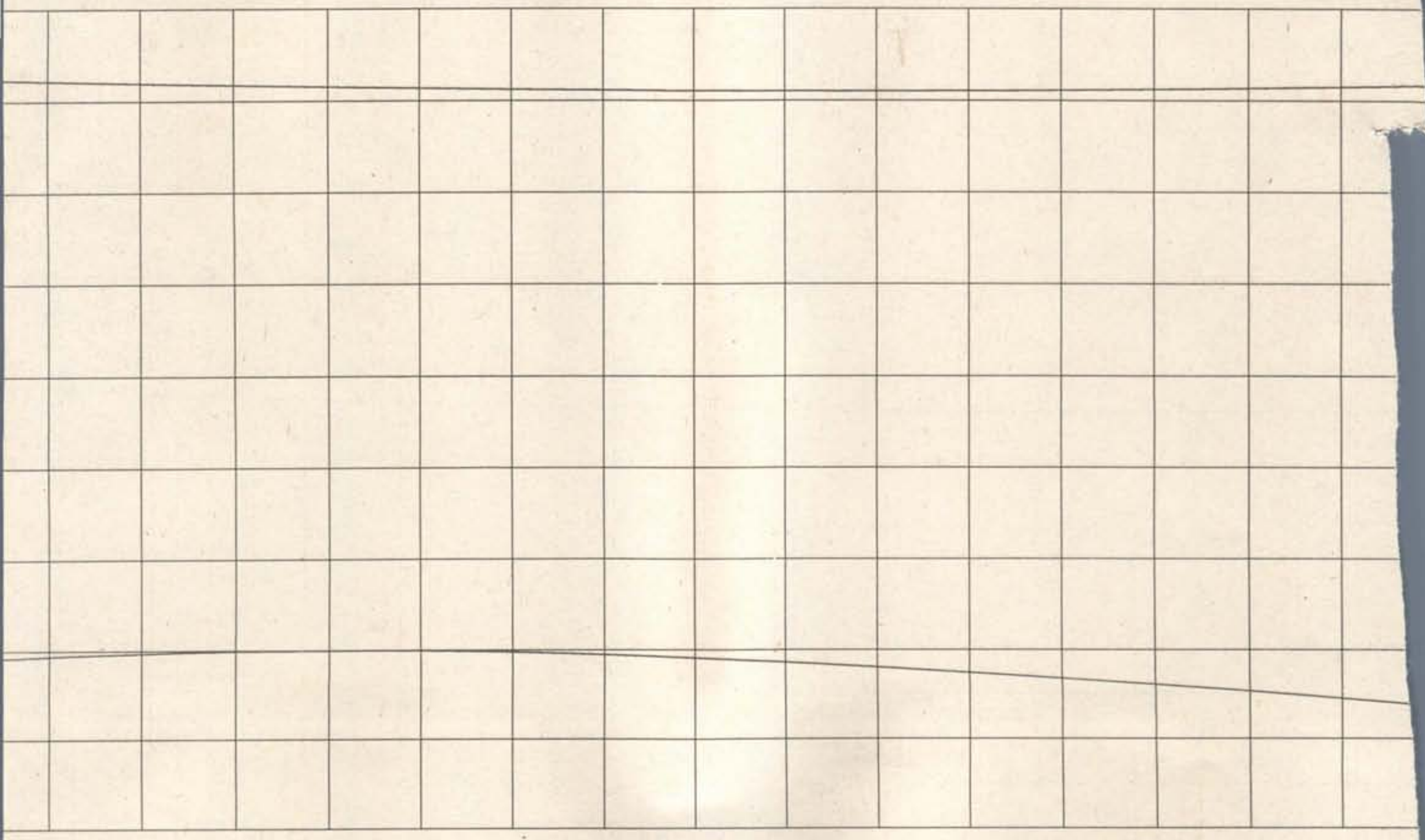
foot patterns



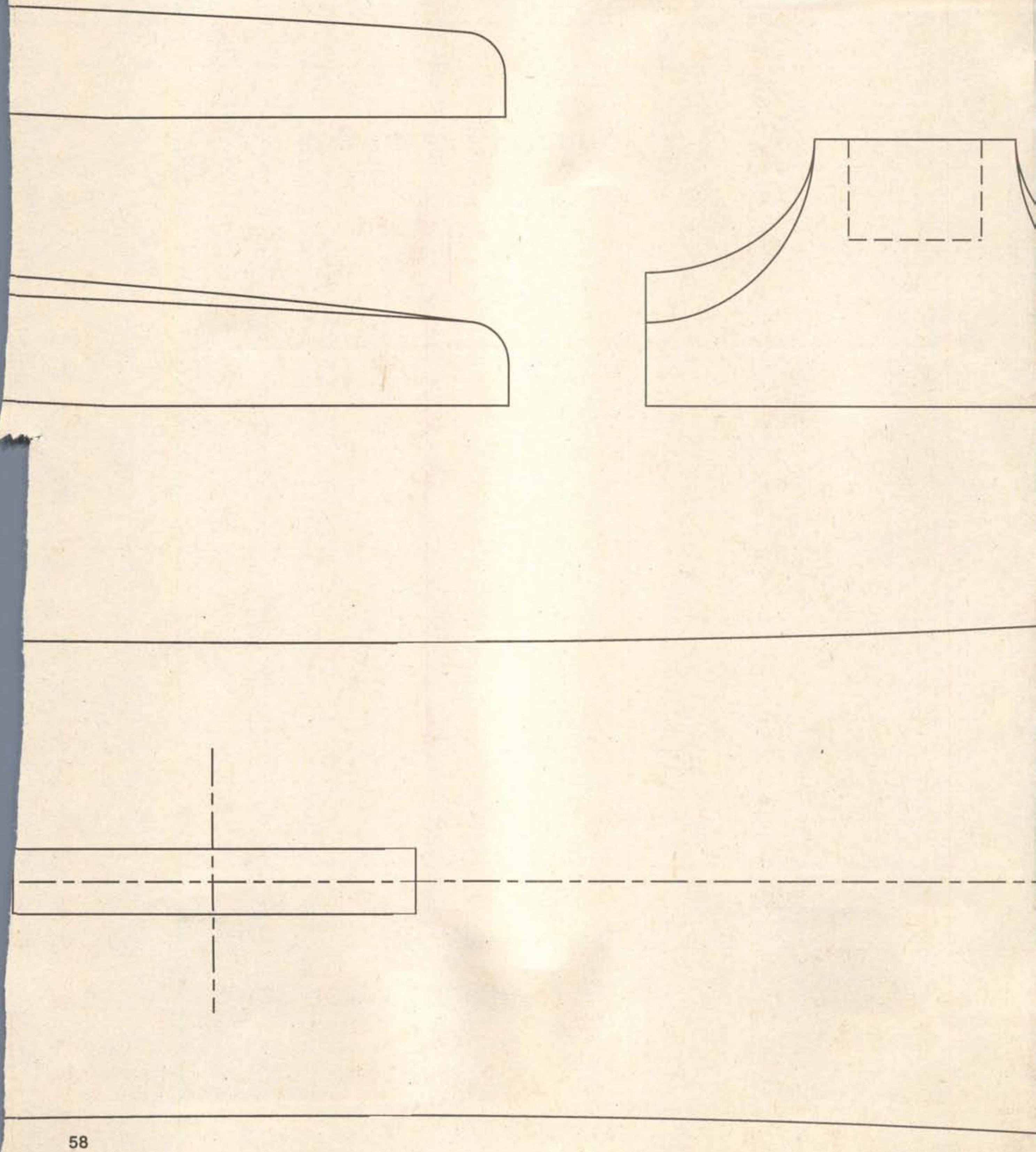


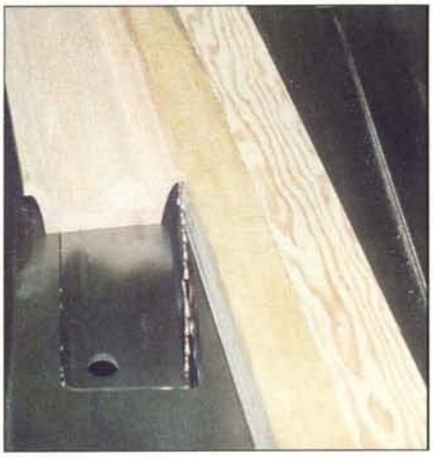


Nautical Flower Box
Ⓔ
gunwale

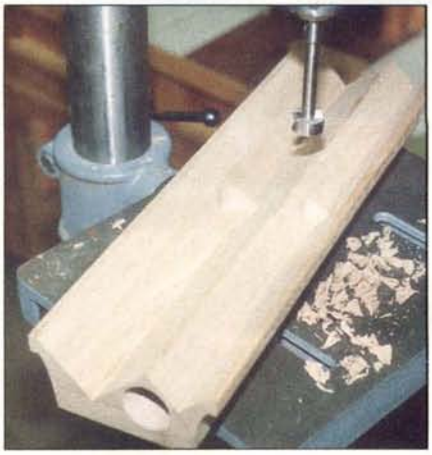


Nautical Flower Box
Ⓓ
curved side

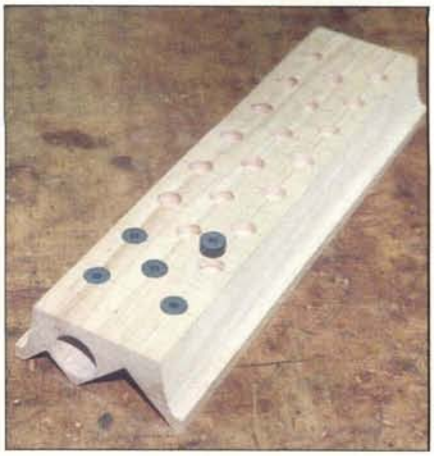




Coves cut into the V block make for comfortable hand holds when removing the V block from a metal surface.



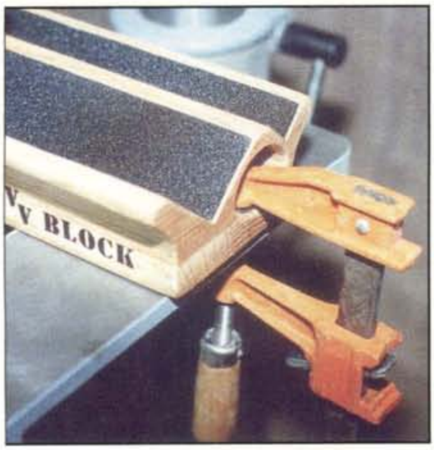
Set the depth guage on the drill press so the the vertical resesses stop ½" short of the bottom.



Cow magnets make for an inexpensive yet effective way to secure the V block to a metal surface.

are necessary to complete both cuts.

To form the hand grips, clamp an auxiliary fence to the table saw at an angle. To determine the angle and location of the auxiliary fence, extend the saw blade to the height of the cove as marked on the end of your blank. Sight over the blade to align the cove pattern until the correct angle is determined. Lower the blade and clamp the auxiliary fence into position without moving your stock. The auxiliary fence must be as high as the block so that the workpiece is always in contact with the fence as you cut the coves. Push the block across the blade in a series of increasingly deep cuts.



While the magnetic base provides much stability, clamp seat holes drilled in the ends allow for maximum accuracy.

The clamp seat holes are drilled at each end of the V block as positioned in the end pattern that you marked previously. Drill to a depth of 2" with a 1⅜" Forstner bit. Align the holes accurately because they are drilled close to the Vs. Leave ½" at the bottom of the block as clearance for the magnets.

Use a 1½" Forstner bit to drill the vertical recess in the large V–cut and a 1" Forstner bit for the small V–cut. It's important to set the depth stop on your drill press so the two holes don't interfere with the magnets. Leave a ½" space along the entire bottom surface.

Magnetic Base

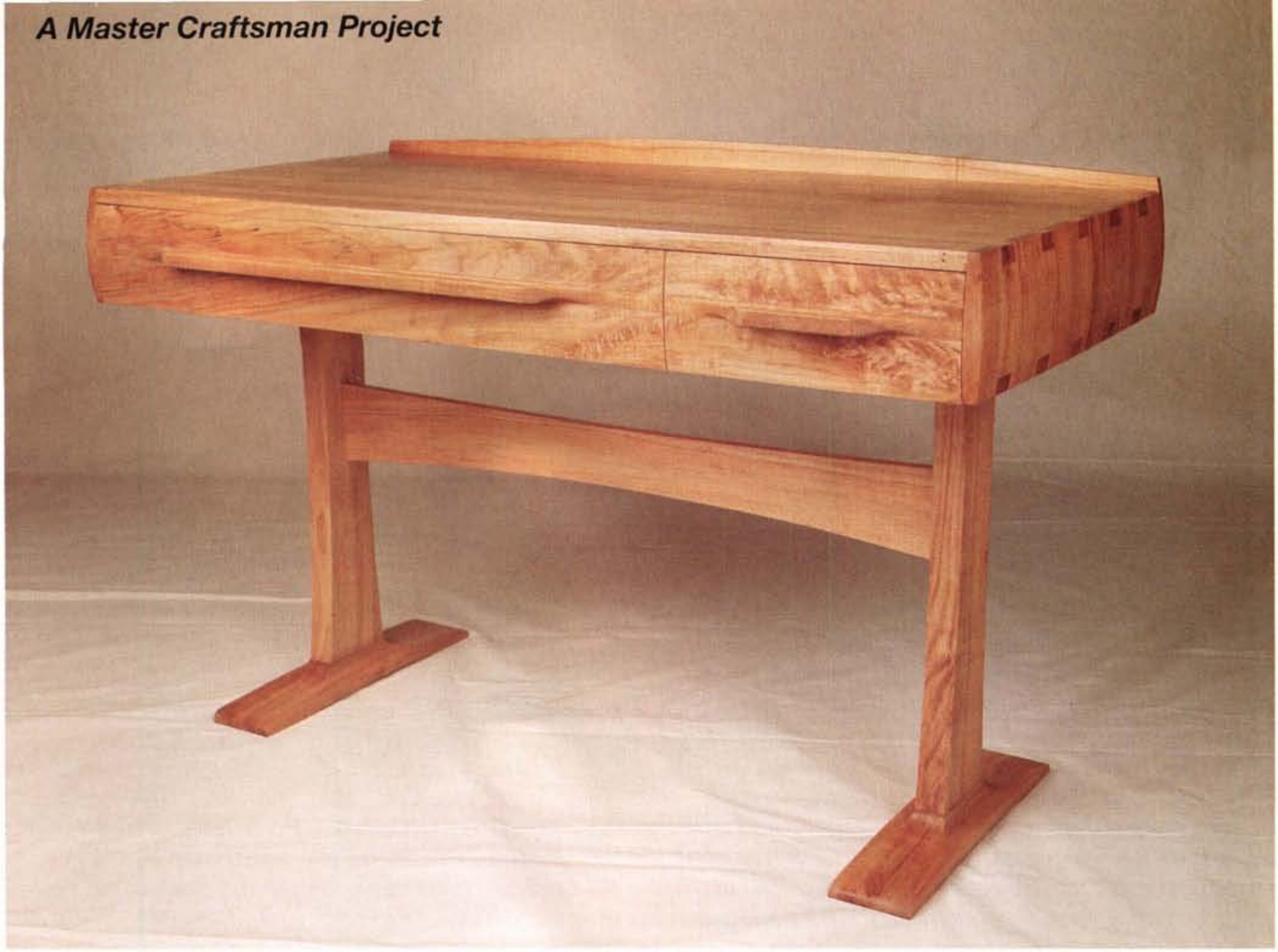
I've found cow magnets to be the best suited for the magnetic base. Cow magnets are available through veterinarians and farm supply stores. I used 23 magnets ¾" in diameter by ⅜" thick (available from Power Magnets, USA. Tel. 800 669–5691). Distribute the magnets equally across the base in a pattern similar to that shown in the photo. Use a ¾" Forstner bit to drill holes slightly deeper than the thickness of the magnets. It is extremely important that the magnets are flush with the base. If one protrudes, even slightly, the V block will rock. Mix enough 5 minute epoxy for four or five magnets. Quickly coat the inside of the holes with epoxy and press the magnets into the holes. Some may need to be tapped down, or even clamped in place until the epoxy sets. Others may fall below the surface slightly. If that happens, pull them flush by attracting them to a flat piece of metal.

Finishing

Round the sharp edges and corners and sand the through 220–grit sandpaper. To sand the base clamp, adhere a piece of emery paper to a flat surface and, holding the block firmly, move it back and forth until the base is perfectly flat and the magnets are flush.

Seal the entire V block with two coats of lacquer. Apply anti–skid tape to the surfaces of the Vs and the bottom. Anti–skid tape is available from most hardware stores. Cover the sides of each V–cut individually. Cut the anti–skid tape larger than needed, press it on, then remove the excess with a fine file. Apply a final coat of lacquer. Lacquer brightens and seals the anti-skid tape and it bonds the edges of the tape to the wood.

The lettering along the edges of my V block was done with pressure sensitive type prior to the final coat of lacquer. This is optional but adds a personal touch. PW



Contemporary Desk

A master craftsman approaches each project with thought and patience. From wood choice to joinery, all elements must embody commitment and consistency. Ken Sadler's designs are the basis for our new Master Craftsman forum. His pieces speak both of his Oregon environment and a seasoned understanding of furniture design.

by Ken Sadler

There comes a time when every woodworker wants to stretch himself a little, go beyond what he's been doing and build a piece that is more interesting and more challenging. This desk is an opportunity to do just that. There is quite a bit of hand work that requires considerable skill.

Part of the difficulty of this project is that very few of the edges and surfaces are flat. However, the curved edges and surfaces cannot be shaped until other operations are completed. This is very important. If you don't do things in the proper order, you're going to run into all kinds of trouble. I suggest that before you begin work on this project you read through the story and familiarize yourself with each task and the order in which you should do it.

There are two places on this desk where the choice of wood makes the difference between a beautiful piece and an ordinary one. The boards that make up the top and sides of the case should be carefully chosen for a distinctive grain pattern so the parts will look like they were made from one board. The drawer fronts should be made from one board and the wood for the handles should be chosen so that they blend into the fronts. I have some suggestions as to the type of wood you might use. Western maple is beautiful, particularly if you can find boards with heartwood in them. If you can find it, red gum has some beautiful grain patterns, as does black walnut and English walnut. Honduras mahogany will do, but it's quite expensive. Red alder is great if you can find boards from old trees—those from young trees have no character. Stay away from oak, both red and white. They're too straight grained and don't lend themselves to this design. Above all, if you want a dark piece use a dark wood; don't use a light one and stain it.

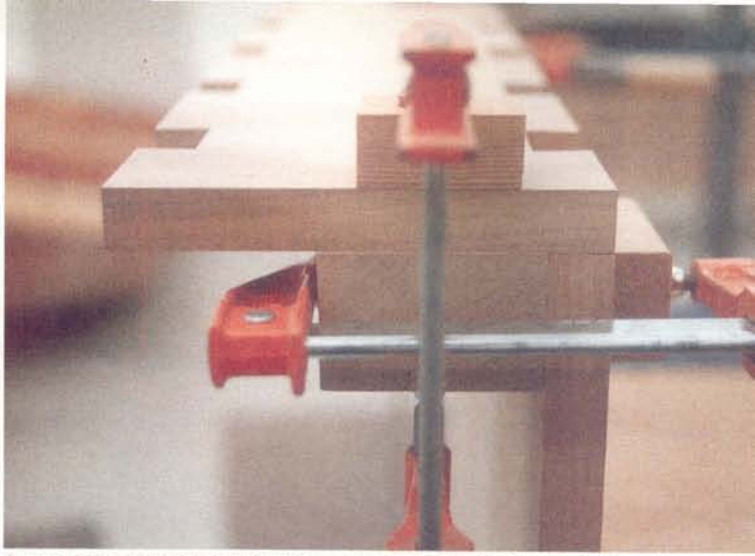
The accompanying drawings are important, but there will be instances where the dimensions shown are only for reference purposes and you should take the actual measurements from the part with which it will be mated. For example, layout a mortise from the matching tenon or a drawer from the pocket into which it will slide. This project breaks down into two major assemblies: the case with the drawers and the base. Build the case first.

The Case

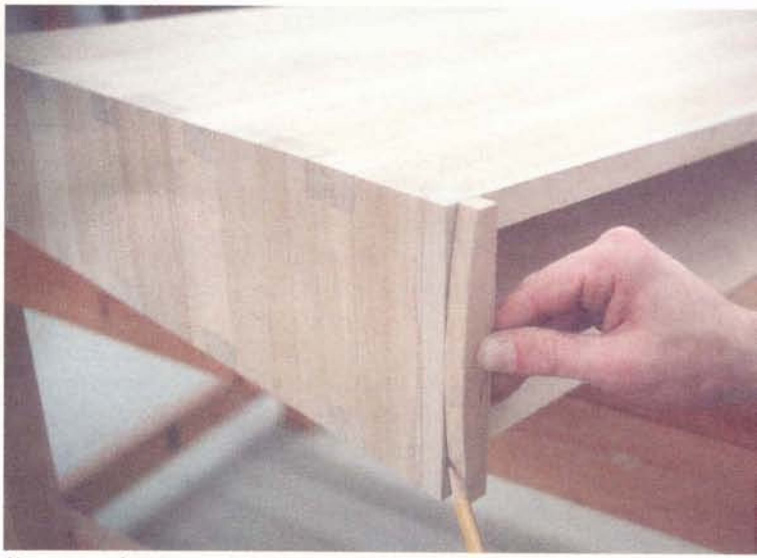
Glue up two panels, one ¾" X 24½" X 61", for the top and the sides; and one ¾" X 24" X 48½", for the bottom. These are rough widths and lengths. Since the first panel makes the top and the sides, find boards with a distinctive grain pattern. The boards should fit together so that when they're glued up they look like a single board. Use a plain butt joint which you have planed slightly hollow. The reason for this is that when you pull the joint together with the clamps you will put the ends in compression. Since wood loses moisture faster at the ends of the boards than in the middle, the ends tend to shrink more than the middle. Because they're in compression, it's less likely that the joint will open at the ends.

When the glue has dried for a day, hand plain both faces smooth. Cut the large panel to a finished width of 24" and the small one to a finished width of 23¼". As I previously mentioned, you want the large panel to become the top and sides and you want the grain lines to flow across the top and down the sides. Mark the surface you want to be the top and which edge is for the front. Find the center and draw a line across the width square with the front edge. Measure 24" on each side of this line and draw lines square with the front edge. Make chalk marks across those lines that are different for each line and mark the pieces outside the lines "right side" and "left side". Now, carefully cut the panel along the lines. The cutoff pieces are the sides of the case. Cut them 6" wide. Make this cut on the edge opposite from the one you just cut, otherwise you'll break the flow of the grain lines. Both sides must be exactly the same size. You will notice from the drawings and the pictures that the outer faces of the sides are curved. Do not do any shaping at this time. Cut the bottom panel to exactly the same length as the top.

Now it's time to lay out and cut the dovetail joints which hold the case together. The tails are on the sides and the pins on the top and bottom. Lay out the joints similar to those shown on the side view Figure and hand cut. Don't use a router and jig or you'll kill the feeling of a hand crafted piece. After you cut the tails, mark the ends of the pins in the top and bottom from them. With a joint this long, it's best to have both pieces clamped in their proper position before doing the marking. A simple way to accomplish this is to clamp the top or bottom vertically against the end of your workbench. Clamp a fairly wide board across the inside face of the panel flush with the panel edge. Place the side in its proper position relative to the top or bottom and clamp it to the board. Now you can mark the pins with a sharp knife. When marking the bottom, notice that the sides and bottom are flush at the back edge. Make the joints an easy push fit rather than a tight one. When you have cut all four joints, dry assemble the case to be sure that everything fits properly and is square. If anything doesn't fit , now is the time to fix it. When the fit is right, apply the glue and assemble the joints. Be sure and check



Lay out the pins from the tails on the case joints. Clamp both pieces together using a square length of stock for stability.



Use a template to mark the curve on both ends of each side. These marks act as guides when shaping the sides.

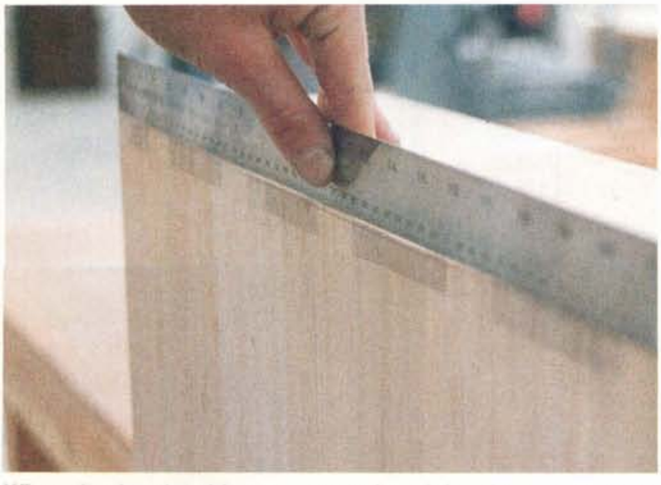
Hand shape the sides. When working across the grain, plane toward the center to prevent chipout.

for squareness. If this box is not square you will never be able to make the drawers fit properly.

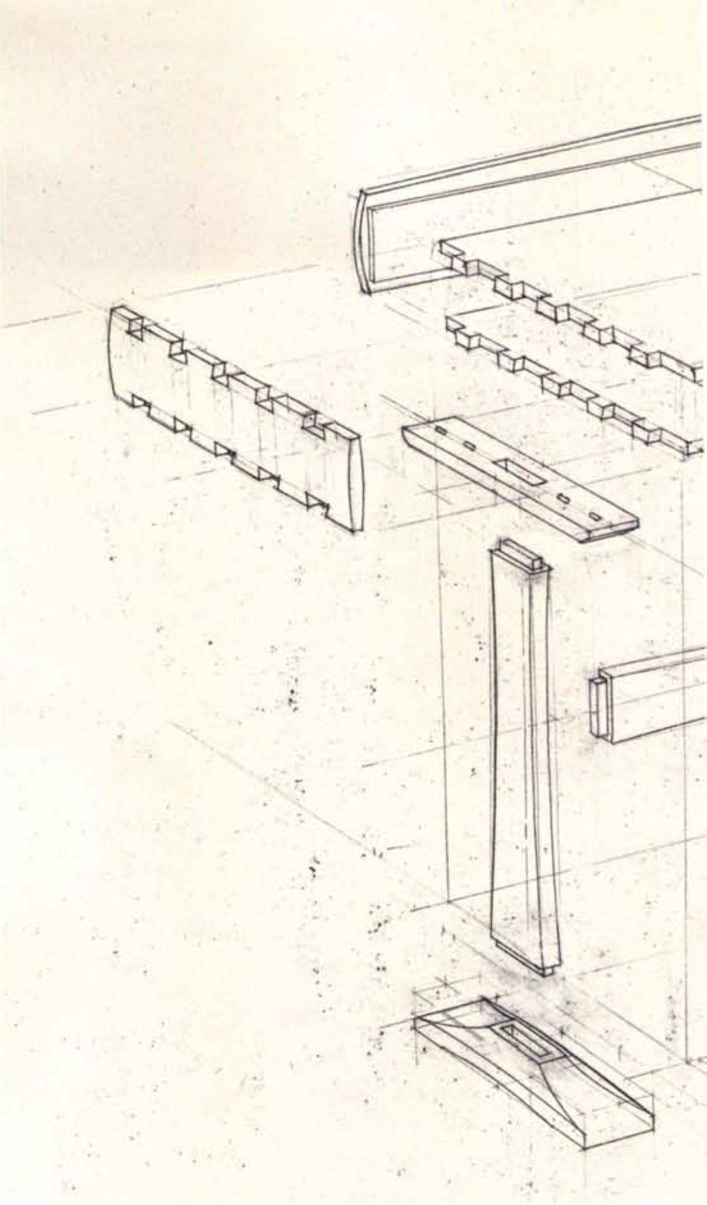
The back is made from a board ¾" X 7" by the exact length of the case. Cutting rabbets on all four edges of the back leaves a raised area which fits into the rear case opening. Cut a ¾" X ¼" deep rabbet along the bottom and sides of this board. Measure the inside height of the case and cut a ¼" deep rabbet extending to the top of the board so that the remaining raised area fits snugly inside the case. That's all for the back right now, it will be shaped after the case sides have been shaped.

When the case is thoroughly dry, shape the sides. Make a template of the curved side profile from the full size drawing given in the PullOut™ Plans. Draw the curve on both ends of each side. Connect the ends of the front and back curves with a straight line across the top and bottom. This line will act as a guide to keep the side straight during the shaping operation. Use a smooth plane to shape the sides to these curves. Because you're planing cross grain, you should plane from both ends toward the middle. Use a steel straight edge as a guide to keep the sides straight.

Place the back in position and mark the side curve on both ends. Draw a line to mark the top edge of the case on the back. Shape the curved ends of the back with a spokeshave. Layout the curve on the top of the back similar to that shown in the front view Figure. If you'd like to design some shape other than that shown you should do so. Bandsaw the shape and clean up the edge with a spokeshave. Fasten the back to the case with #5 X ⅞" FH brass wood screws. Use two on each end and four along the top and bottom. With the back in place, sand each side flush with the back. Finish sand the rest of the case assembly.



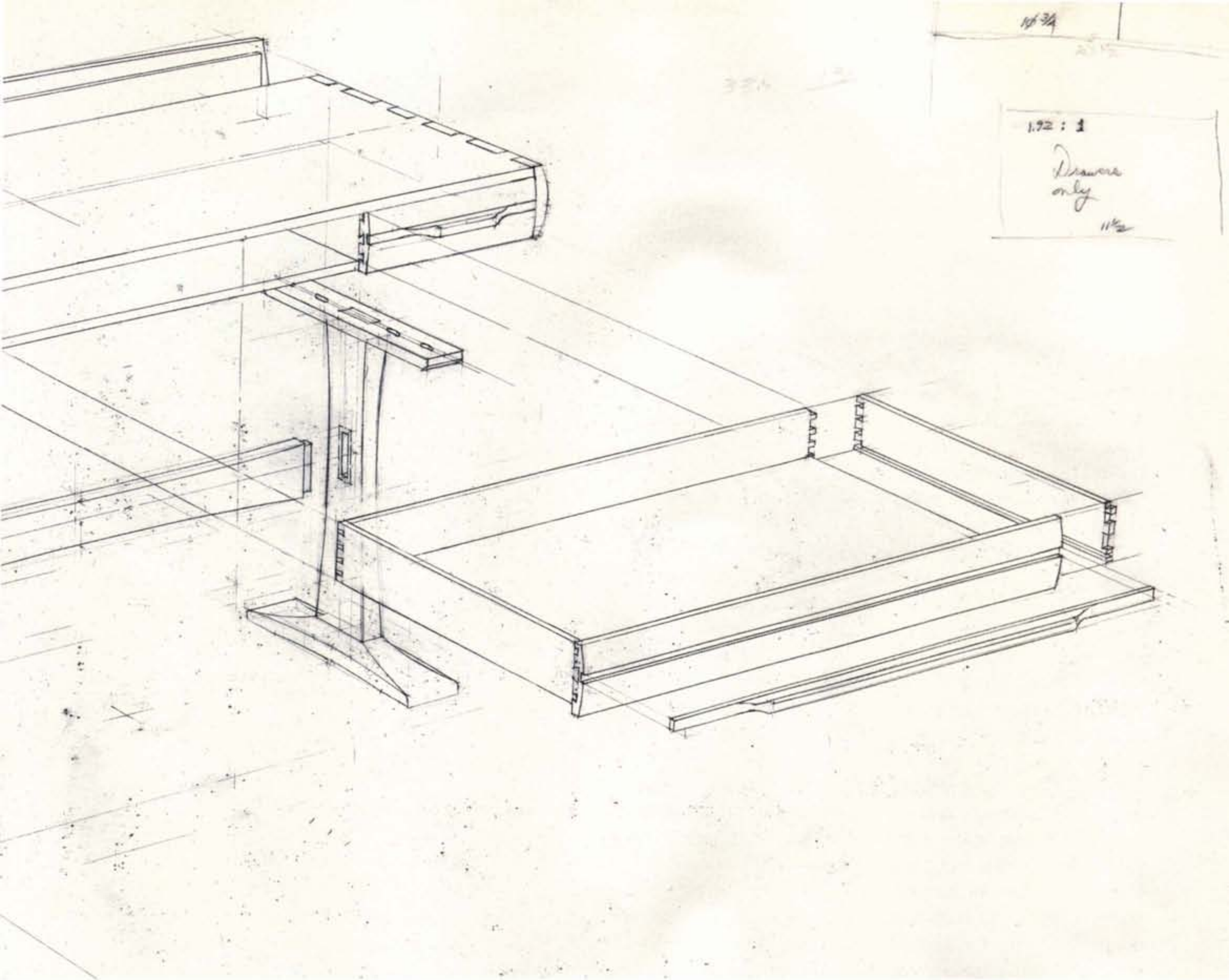
When shaping the sides, use a metal straight edge to ensure an even surface.



The Drawers

The size of each drawer is determined by you and the height and width of the opening in the case. Your part of the decision is the width of each drawer. There are two and you can make them equal or, as I have done, one narrow and the other wide. The drawer fronts are the most important so we'll start with them. In the beginning they are one board ¾" thick. The width is the distance between the underside of the bottom and the underside of the top. The length is the width of the case opening plus the kerf of your circular saw blade. In choosing this board look for one that has flowing grain lines that are curved like waves. Find one wide enough in the rough so you can rip a 1⅜" strip from one edge. This strip will make the drawer handles and they should blend with the fronts. To understand this better, look at the cross section Figure of the drawer and case assembly and at the picture (page 66) showing an end view of an open drawer.

Make a template of the drawer front ends from the pattern given in the PullOut™ Plans. Decide which surface you want to be the outer face of the fronts and the bottom edge and mark them clearly. Place the template on each end of the

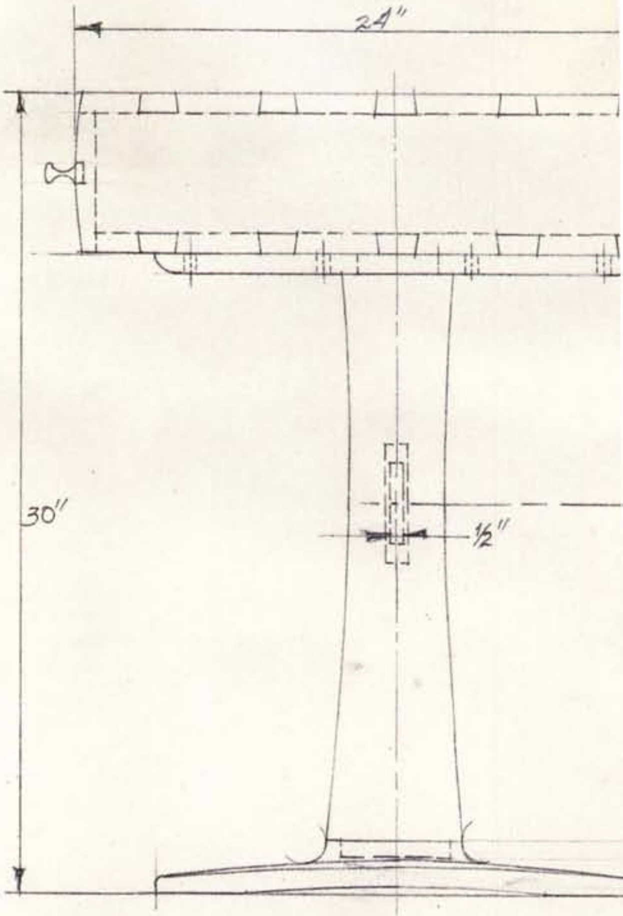


board so that it's aligned with the bottom edge and the inner face, then draw the lines for the curve and the handle notch. Connect the ends of the curve along the length of the edge to provide guide lines to keep the face straight when planing to the curve. Cut the ¾" X ¼" deep dado where indicated by the notch in the template. Finally, use a smooth plane to shape the outer surface of the drawer fronts to the curve.

The handles are also made as one piece. Use the ¾" X 1⅜" handle strip you cut from the drawer front board. Make sure that the ¾" edge of the handle fits snugly in the dado. To form the handle use a 1" half round moulding cutter and a ⅛" radius round over router bit. Set the moulding cutter in the table saw so the tip of the cutter at the high point of its arc is ¼" above the table top. Set the rip fence ¼" from the cutting edge. Run both 1⅜" faces through the cutter with the same edge against the rip fence. Use a ⅛" radius roundover bit in your router table and run the corners of the handle opposite to the edge that was against the rip fence.

Decide on the width of the drawers. Draw a line on the drawer front, square with the bottom edge at the dividing point. Fit the handle into the dado and transfer the drawer dividing point onto it. Draw a line on the handle where it meets the drawer front dado. This will mark the depth of the dado along the length of the handle. Place the handle flat on the bench and, working from the dividing point, mark the center of each drawer. Each end of each handle is concave and tapered flush with the drawer front as shown in the drawer detail photo. The full width of each handle extends to within 6" of each side of each drawer. Mark the points where the handles will start tapering. From each point draw a 4" radius curve to the dado depth lines. Bandsaw to these curves. Leave the line plus a little extra. Put the handle back in the dado. At all points, the band sawed edge should be above the surface of the front board.

Glue the handle in place. Put glue sparingly on the sides and bottom of the dado. Both ends of the handle must be flush with the ends of the front board. Blend the handle into the front board. Take all the sharp corners off the handles and flow the surfaces together. Use a variety of fine cut files and sandpaper starting with 80–grit and working up to 150–grit. The parts of the strip between the actual handles is flush with the face of the drawer fronts When done to your



satisfaction, cut the fronts apart at the dividing point and fit them in the case. They should fit easily, but there should be no sideways play. Now you can build the other parts of the drawers.

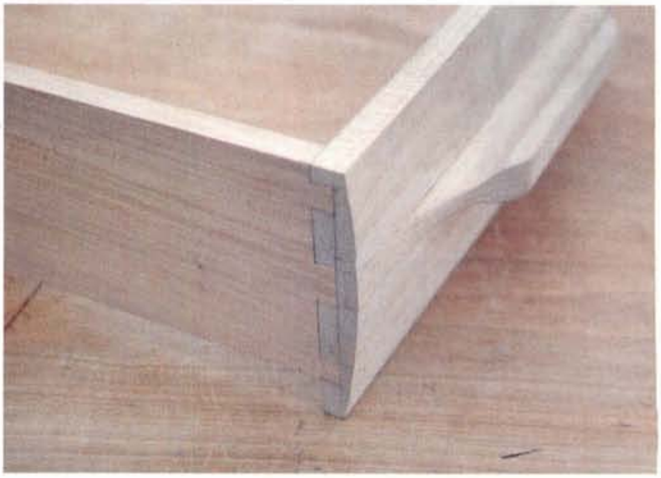
You already have the width of the drawers, the height is determined by the height of the drawer pocket. The depth of the drawers is 21¾" overall. The sides should be 21⅜" X ½" thick. The backs match the fronts in width and the sides in height and are ½" thick. Cut the four sides and the two backs to fit. They should slide smoothly and freely in the drawer pocket, but not be sloppy.

In laying out the dovetail joints, the tails go on the sides and the pins on the front and back. The top edges of the sides, fronts and backs are flush. The bottom of the fronts is ¾" below the sides in order to cover the edge of the case bottom. This is shown clearly in the drawer/case cross section. I have left the design of the joint to you. However, notice that the front joint is a blind dovetail and the rear a through dovetail. Also note how the dado for the drawer bottom runs through the bottom tails. As with the case joints, these make a better impression if they're hand cut rather than machine cut in a jig.

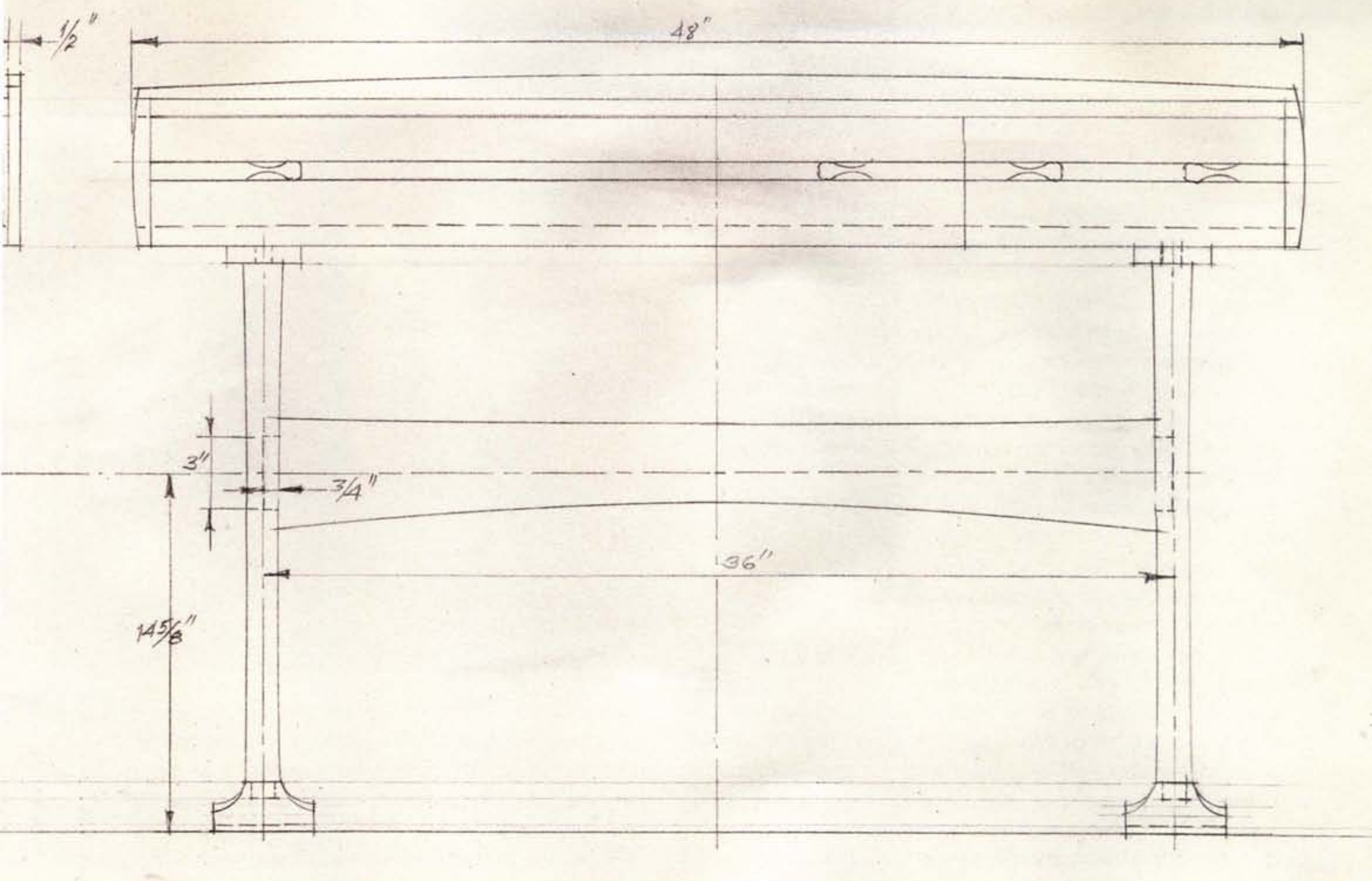
After you've cut and fitted the joints, cut the drawer bottom dadoes in the sides and backs. The top of the dado is ⅜" from the bottom edge and is ¼" X ¼". Dry assemble one side to each front and mark the location of the dado in the fronts and cut the dadoes. Rip off the bottom part of the backs up to the top of the dado. Now assemble the drawers dry and see that they slide in and out of the case smoothly. If you have been careful in sizing the parts there should be no trouble with the fit. You can now apply the glue and, while it is drying make the panels for the drawer bottoms. Don't use plywood or chipboard. I made mine out of basswood. Make the panels 5⁄16" thick with the grain running the width of the drawer. Make them a bit oversize so you can trim to the exact size after the glue has dried. Rabbet the sides and the front to fit the drawer bottom dadoes. Make it an easy sliding fit. Fasten them in place with #5 X ⅝" brass wood screws through the bottom into the back. Use one screw for narrow drawers and two for wide ones.

The last operation on the case is to shape the front edges of the sides and top. Put the drawers in place and draw a line conforming to the drawer faces on the inside face of the sides and top. Remove the drawers and use a spokeshave

Clamp the drawer front flat on your bench and shape the curve. Time and patience yield beautiful results.



Half blind dovetails are structurally sound and contribute to the depth of detail.



and smooth plane to shape the edges. Replace the drawers and sand the edges flush with the drawer fronts. Don't try to hide the fact that the drawers are there. In fact, set them off by slightly breaking the corners of the drawer fronts and the case edges where they meet. Do the same with all the other corners of the case except the front edge of the bottom and the edges against where the back attaches. Do not break the corners where the two drawer fronts meet, this would break the continuity of the grain pattern across both fronts.

For a perfect fit, always mark mortises from their corresponding tenons.

The Base

The first step in making the base assembly is to make the spreader. Start with a piece 3/4" X 4½" X 37½". Draw a centerline the length of the piece. Cut the tenons as shown in the side and front view Figures. Carry the centerline down across the tenon. Lay out and cut the curves on the top and bottom edges of the spreader. The curve on the bottom edge of the spreader is 1¼" up from the edge of the board at its center. The curve on the top is ½" down at the center.

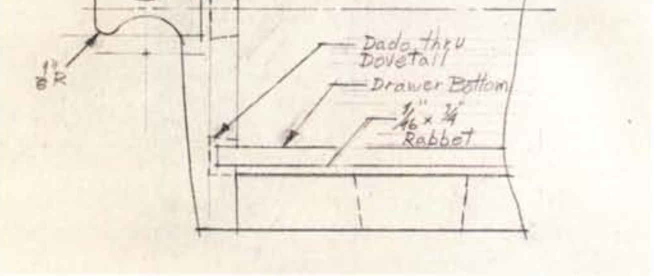
For the legs, start with boards 1½" X 5" X 22¾". Label the top and bottom ends. Draw a vertical centerline and a horizontal line at the center point of the leg mortises as dimensioned in the front view Figure. Line up the spreader tenons with these lines and mark the top and bottom ends of each mortise as shown in the photo. Measure the width of each tenon, then lay out and cut the mortises accordingly. Cut the leg tenons as shown in the PullOut™ Plans. Carry the vertical centerline down across them.

Both faces and both edges of the legs are curved. Make templates of the face and edge shapes from the patterns given in the PullOut™ Plans. Place the edge template in position on each edge of each leg and draw the lines. Use a spokeshave to shape the faces to the lines. Make sure the surfaces are flat across the width of the leg. Place the face template in position and draw the lines. Bandsaw the shape leaving the lines. Finish with a spokeshave. Sand all four surfaces just enough to get the tool marks out. Put the spreader

and the leg together and mark the new leg contour on the spreader tenon shoulder. Carefully cut this so that the tenon shoulder matches the contour of the leg.

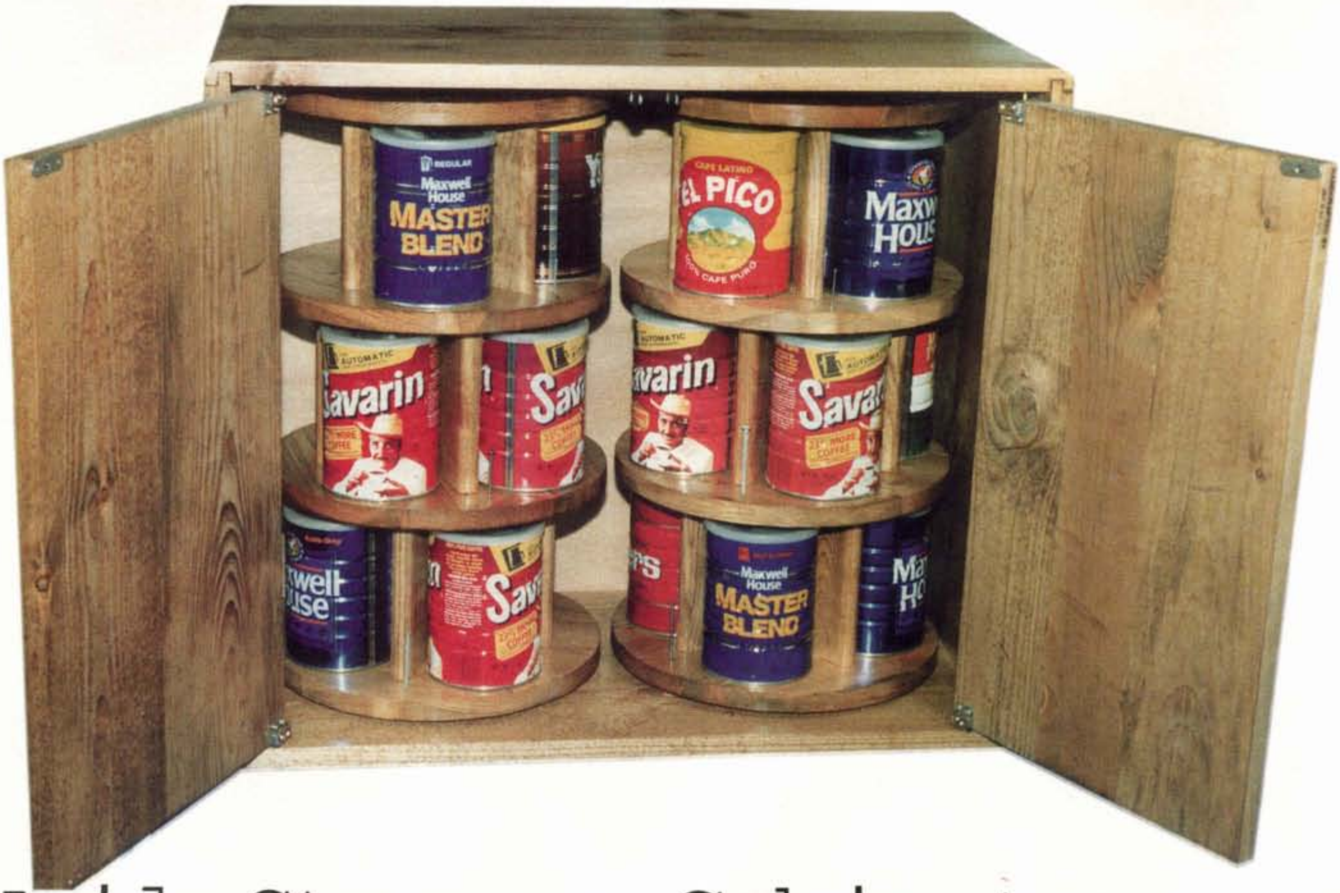
Each case support member is ¾" X 3" X 18". Round over each end of each support as shown in the side view Figure. Draw horizontal and vertical centerlines on the face of each support and lay out the mortises from the leg tenons. There are four slots on each support for the mounting screws. Each slot is 3/16" X ⅜". These are necessary to accommodate the expansion and contraction of the case with changes in humidity.

The last parts to make are the feet. Start with 2" x 4" x 18" blocks. Decide on the top surfaces and mark them. Locate, size from the tenon, then draw and cut the leg mortise. Fit the two parts together and draw the outline of the leg on the foot. Carry the end lines across the blank. Make two templates from the patterns given in the PullOut™ Plans—one for the outline of the full side view of the foot and one for the side view up to the first curve above the bottom. Trace both templates on each side of each foot. Make sure the curved lines that meet the top match the leg lines you drew across the top. If they don't match adjust the curved line until they do. Bandsaw the feet to the outline of the full side view, leaving the lines. The most difficult part of the foot is cutting the side curves. Study the drawings and look carefully at the picture on page 60 so you understand just how it's supposed to look. I found the best tools to rough this out are a 18 or 20mm #7 carving gouge for the main part and a 4 or 6mm #7 for the small part of the curves along the outer ends of the foot. There is no way you can draw this curve, you will have to look at the the picture and shape it by eye. When you have everything roughed out to your satisfaction fit the leg and the foot together and glue them. Use files and sandpaper to smooth and blend the surfaces into the leg so that the leg looks like it grows out of the foot—not just attached to it. With this done, you can fit the case supports to the top of the legs and glue them.



Assemble the leg assemblies and the spreader dry. Make sure the legs are parallel and square with the spreader, the feet are parallel, and the joints between the spreader and each leg are smooth and tight. This is not easy because there are so many contoured surfaces. One way to do this is to clamp a straight board to the back of your bench top, place the ends of the feet squarely against it and check that each foot is flat on the bench top. Make sure the distance between the feet is the same front and back and the distance between the legs is the same top and bottom. Also clamp the assembly together across the spreader. Because the spreader is narrow and the leg is wide, you will need two clamps, one on each side. Adjust the clamps until the above conditions are met. When you're satisfied everything is as is should be, take it apart and apply glue to the sides of the mortise and a bit to the shoulder of the tenon. Be careful here because you don't want it to squirt out of the joint. If it does, don't wipe it, let it dry, then remove it with a sharp chisel. Wiping the glue when it's wet drives it into the wood pores and you'll never get it out. I would leave the assembly in clamps for at least several hours.

When the assembly is fully dry, mount it to the case with #8 X 1¼" wood screws. For finishing, however, you will find it easier to have the leg assembly, the case and the drawers separate. As to the finish, I recommend Formby's Tung Oil Finish (Low Gloss). Apply it with a brush and let it soak in for several minutes then wipe all the excess away. Apply as many coats as it takes to get the amount of gloss you want. I've found that it's best to apply the first coat generously and subsequent coats sparingly. PW



Nail Storage Cabinet

by Jim Raevis

All too often the unlabeled coffee can containing the nails or screws that I need is in the back of the shelf, hidden behind the others. It's always an inconvenience to first move the front ones out of the way, then put them all back, just to get that one can. As a result I decided to build a cabinet that would give me convenient access to as many storage cans as possible.

Before beginning this project I tried to visualize how many cans I could easily accommodate without making accessibility inconvenient. I also wanted to make the storage arrangement as dense as possible since my available space for tools, let alone hardware, is at a premium.

I opted for a design that uses a three–tier lazy susan arrangement. Each arrangement consists of four cans per tier, three tiers high and two arrangements per cabinet. This design allows for easy access to each of the twenty four coffee cans without taking up too much space. In keeping this design as simple as possible I kept the number of pieces to a minimum. As a result it only takes seven different wood parts to build the entire unit.

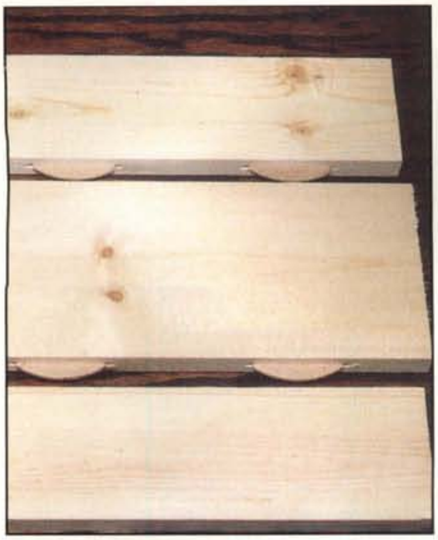
The first step in building the nail storage cabinet is to prepare all of the glue–up panels. I used my jointer to prepare the edges, then used both wood glue and biscuits to create the bond. Today's adhesives are usually sufficient, but I decided to add the biscuits since the shelves and cabinet can become heavy if all twenty four cans are full.

Eight small panels are required for the round shelves (A), two for the front doors (B), two for the sides (C) and two for the top/bottom (D). If you so desire, larger glue ups can be made for a combination of any of the parts. I fabricated eight small glue–ups for the shelves and two large panels for the remaining parts (each large panel was sized to accommodate one door, side and top/bottom).

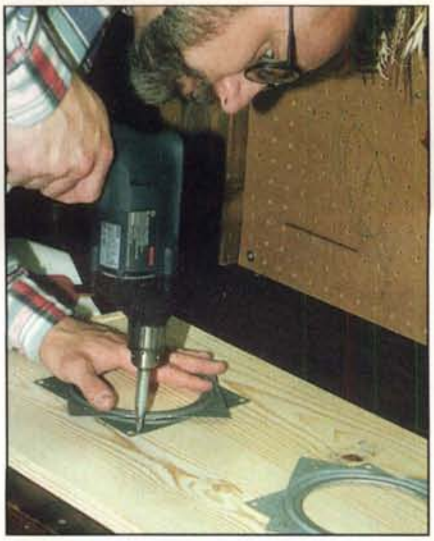
After the glue had dried sufficiently I used a hand held jig saw to free hand cut the circular shelves. Had this round piece been targeted for fine furniture I would have used a circle cutting jig with

Place a sample nail next to each can for easy identification.

Jim Raevis is a mechanical engineer from Fair Haven, New Jersey.



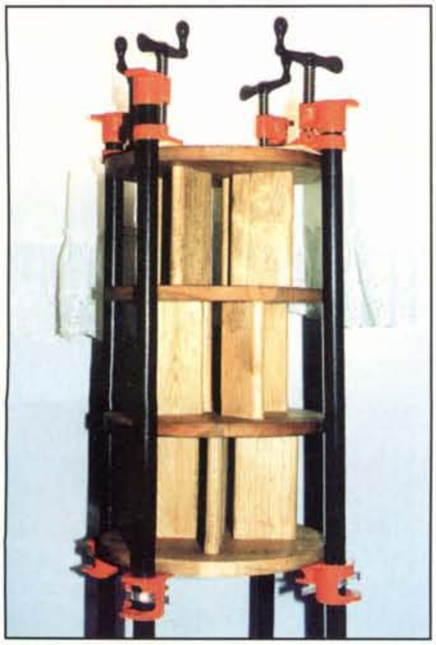
Biscuit the panels for strength so they will support full cans of nails.



Use the holes in the lazy susan as a drilling guide.

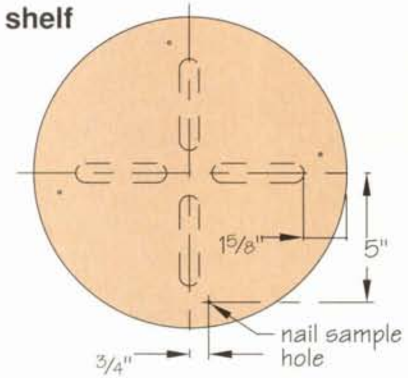
If you cut out the shelves with a jig saw, you'll want to smooth the saw marks.

Biscuit the supports to the shelves for strength.



Gentle pressure, just enough to bring the parts together, is all that's needed.

my router. Since its destined to be inside the cabinet where no one will normally see it, I decided that a free hand cut was good enough. After cutting the shelves, pencil mark all the locations for the biscuit slots, lazy susan mounting screws and sample holder holes. When drilling the lazy susan mounting holes, use the holes in the bearing as a template (preferably with a vix bit). Make sure you use the proper pattern of holes as indicated by the manufacturer.



Take the other panels and cut them down to the sizes shown on the Cutting List. Join the sides to the top and bottom with dado and rabbet joints. Cut these joints as dimensioned in the detail on the following page. Cut ¼" X ¼" rabbets in the sides, top and bottom to receive the back.

Once all the panel cutting is complete, mark the alignment lines to position the two lazy susans on the bottom. As you did with the shelves, use the lazy susan as a template and drill the mounting holes. Remove the lazy susan. Enlarge the through holes to 1/8" diameter, turn the bottom over and counter sink the holes 5/16" deep using a 1/2" diameter Forstner bit.

Make the shelf supports (F) from longer lengths of 1 x 4. Rout the edges with a 3/8" radius bit. Then cut the 32 6" lengths. Next, cut a slot in each end of all the pieces to accommodate a #20 biscuit.

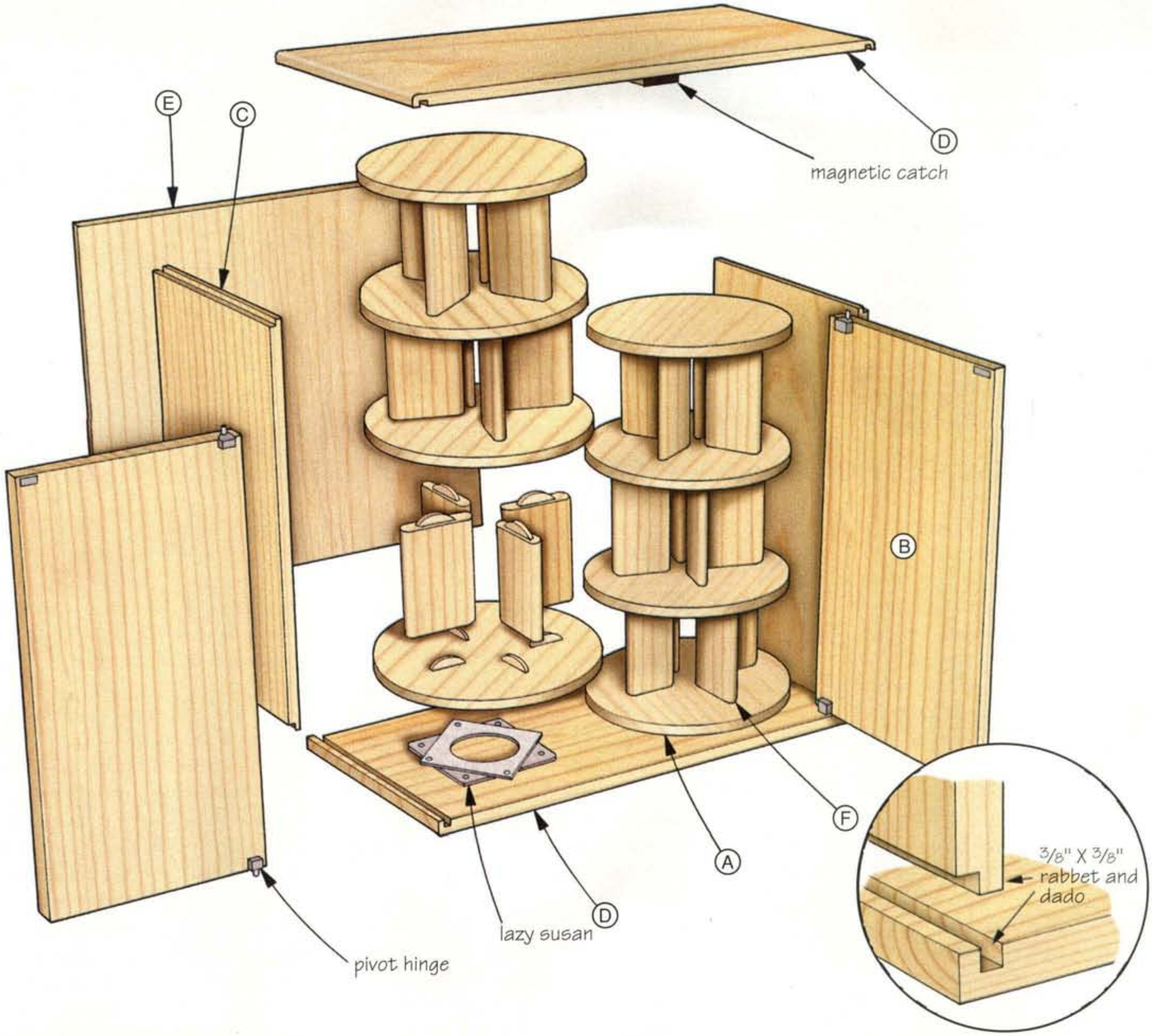
This is the ideal time to sand and stain all the parts. If you wait until after the assemblies are complete you'll find that it's almost impossible to sand them. I've also found that any excess glue doesn't show up if I do the staining first.

Now assemble the top and bottom to the sides with sufficient wood glue in the dadoes. Measure the diagonals to assure that the unit is square. If it is, then use some pipe clamps to hold it in position while the glue dries.

Assemble the three tiered arrangements. Its easiest to start from the bottom shelf and work your way up. Be extremely careful not to mix up the shelves (top, bottom and middle). If you do, you'll be sorry when the mistake is discovered later. Once assembled, clamp the units and allow them to dry.

After the glue is dry, remove the clamps from the cabinet and tiered arrangements. Now is a good time to apply two coats of polyurethane to the cabinet, back, doors and tiered arrangements. After the polyurethane has dried final assembly can begin.

The first step is the doors. Install the pivot hinges using the manufacturer's directions. (Depending on your drill's



Nail Storage Cabinet

Cutting List

Qty	Prt	Finished Size T	W	L	Piece
8	A	¾"	12" diam		shelves
2	B	¾"	12¾"	22"	doors
2	C	¾"	14"	22¾"	sides
2	D	¾"	14"	27"	top/bottom
1	E	¼"	22⅜"	25⅞"	back
24	F	¾"	3½"	6"	supports
Hardware					
1	double magnetic latch				
2	6" lazy susans				
2	pivot hinges pairs				

profile you might have to drill the hole for the pivot insert prior to cabinet assembly. I found out the hard way.) Next, install the double magnetic latch, again following the manufacturer's directions. In this design the latch is in the top of the cabinet for two reasons. One, it's out of the way, and two, you'll never drop a heavy can on it accidentally.

Install the tiered arrangements. Turn the three tiered arrangements upside down and install the lazy susans to the underside of the bottom shelf using the wood screws. Flip the arrangements right side up. Using a ratchet wrench, drive the sheet metal screws into the base until their tips protrude about 1/16" above the surface of the floor. I found that it was easiest if the cabinet overhangs the workbench while installing the sheet metal screws from the underside. Place the arrangements inside the cabinet, aligning the lazy susan's mounting holes on the sheet metal strews. A flashlight came in very handy during this phase of assembly. Before engaging the screws check to see that the tiered arrangements are *properly* aligned. Do this by slowly spinning the assemblies to check for any interference. If all goes well, nothing will hit and the sheet metal screws can be fully installed.

Once each of the three tiered arrangements have been secured in place the project is almost complete. Just position the back into the rabbets and nail it in place using some brads.

Now all that's left is to organize your collection of coffee cans. PW

A Popular Woodworking Project

Nautical Flower Box

by Ken Textor

I don't think I've ever built anything that has brought more requests for "one of my own" than this nautical planter. Even my land locked friends from Iowa want one. It's fairly easy to build and requires no steam bending if the right woods are used.

As a former boat builder, it was easy for me to choose the right woods for this project. Naturally, the wood you use has to be rot–resistant. I found hardwood lumber is best for the flat sides (A, B and C). Sassafras, teak, white oak and the like are suitable. Some of the harder softwoods like cypress, redwood and Port Orford cedar are also fine.

But you should avoid very soft softwoods like white cedar and white. They can be used in parts (D and E) where pliability is important. The flat sides hold screw fastenings, thus the hardwood recommendation. Three– quarter stock will suffice for all parts.

Before getting started, I should say a word here about fairing—the boat builder's favorite catch–word. This project, like real boats, requires some fairing for it to turn out looking like a professional job.

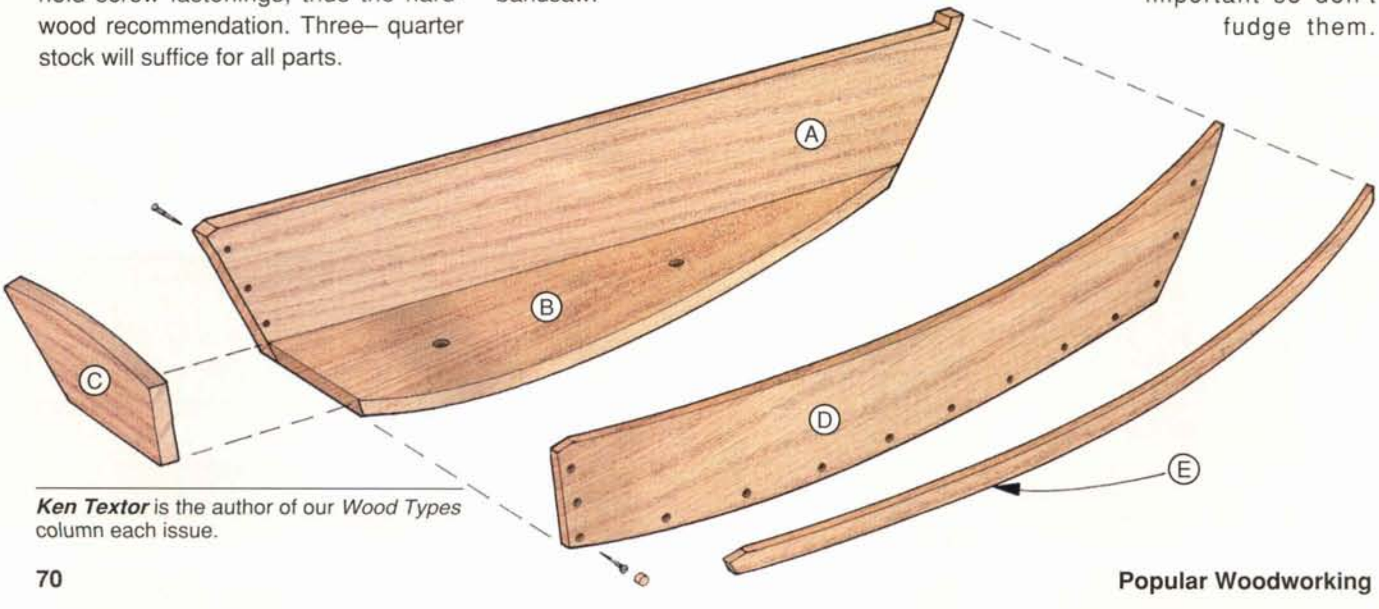
Fairing is simply the act of making parts which don't fit perfectly at first, but end up looking like an exact fit. Even with PullOut™ Plans, an exact fit for a piece of bent wood is not always possible. Every board does something a little different when bent. So be prepared for some fairing.

Cutting out all the parts is best done with a bandsaw if you have one. Lacking a bandsaw, use a rip, crosscut and keyhole saw where appropriate. Even with hand saws, this project can be done in a weekend. In fact, cutting bevels with a hand saw is usually just as accurate as a bandsaw.

There are half–scale patterns for all pieces in the PullOut™ Plans in the center of this issue. The straight side (A) is the easiest to cut out. But you should note that the width includes what appears to be a stem post, that little knob up at the forward end.

Cut out the bottom (B) with a ¾" or narrower blade on the bandsaw in order to be able to follow the curve—a wider blade will not make the curve radius. Note the 70° angle cut as shown on the pattern. Check your bandsaw table with a bevel square, as the scales for setting the table tilt are notoriously inaccurate on bandsaws. The measurements given are for the inside on the box.

Cut out the stern (C), carefully noting the three different angles on three out of the four sides as shown on the pattern. These angles are important so don't fudge them.



Ken Textor is the author of our *Wood Types* column each issue.

Also note that the measurements shown are, again, for the inside surface of this part of the box. The outside surface will measure smaller.

The straight side, bottom and stern are back–fastened in place with evenly spaced countersunk screws. This keeps the fastening out of sight as well as providing an easy surface through which you can fasten. Fastenings should be 1¼" non ferrous and regular screws, not sheetrock screws. Use appropriate counterbores for the gauge of the screw you use. The gauge can be #6 through #10.

Cutting and bending the curved side (D) into place is a little more laborious than the first three parts. From the outset, choosing a good board will save you a lot of hassles in the long run. The board should be free of defects including knots and sap pockets. A quartersawn straight–grained board will work best. Lacking that, avoid boards where, when looked at from the side edge, the grain runs out of the board instead of following the horizontal edges.

Once you've got the right board, plane it down to about 5⁄16". I say "about" because some boards that are a little stiff for bending like cypress, redwood, etc. may need to be closer to ¼". Woods that bend easily, such as white cedar, sassafras, etc. can be as much as ⅜".

Once planed, cut the board to the pattern. Notice no bevels are specified. The fairing procedures will cut the bevel. After cutting the curved side, clamp the board into place. Begin clamping at the stern and move clamp by clamp toward the bow. Each new clamp should be no farther than six inches from the previous clamp. Tougher woods may require closer spacing of the clamps. Whatever you do, don't try to bend the whole piece into place in one move or the curved side will likely break.

Once clamped into place, screw the curved side to the rest of the flower box. Start at the stern and work toward the bow. Don't be concerned about an imperfect fit. That's where you'll do some fairing after everything is screwed into place.

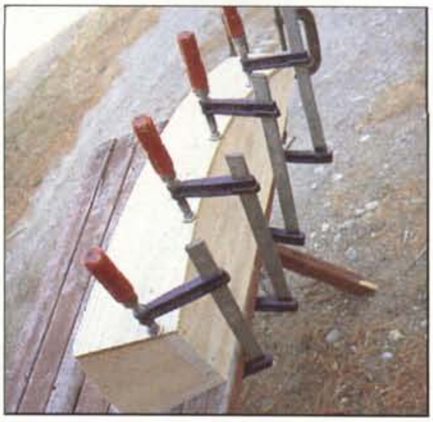
Be sure to locate the screws well away from the outer edges. These edges will require fairing and shaving down screw heads is pretty hard on your fairing tools. Plug the screw counterbores as shown in the illustration to the left. Use waterproof glue for fixing the plugs in place.

The gunwale (E) is easy to install. Make it out of the leftovers from the curved side. This doubles the thickness of the upper edge and makes it look more in harmony with the thickness of other parts of the box. Clamp the gunwale into place in a dry run. Then use a waterproof glue to fix it in place. Gluing this piece helps the curved side maintain its curve over the years.

Now it's on to fairing. In general, fair any edge that doesn't look right. Use a hand smoothing plane to fair where the grain runs parallel to an offending edge. Tidy it up with hand sanding. Use a belt or random orbit sander where the edge grain needs to be subdued. I get the best results using 100–grit.

Finish sand the planter box through 150–grit paper. Avoid using vibrator sanders here because sometimes the vibrations will make the curved side split at the screw holes.

If you want to add some color to the finished project, use exterior house stains. The environment of a flower box is too tough on any other type of finish. Make sure you keep the finish only on the exterior surface. On the interior surface, it can leach into the soil and kill many delicate flowers.

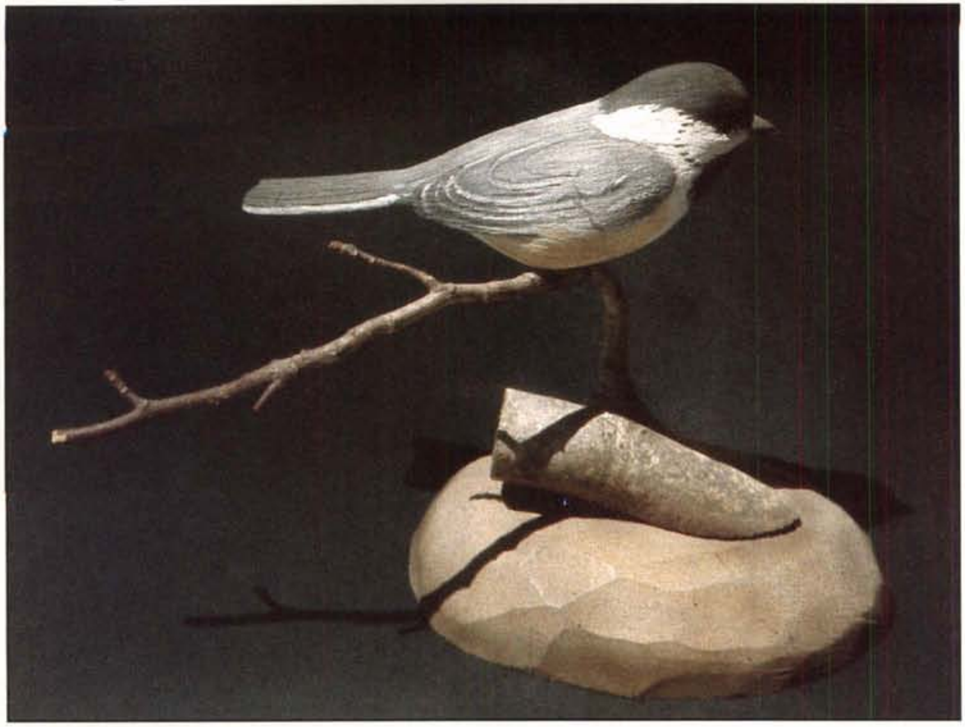


Also be sure to put a couple of ½" drain holes on the bottom of the inside. Otherwise, the plants may drown in too much water. This box should last a dozen planting seasons or more. In honor of that durability, I usually plant impatiens which continually bloom handsomely and last the entire planting season. PW

Nautical Flower Box					
Cutting List					
		Rough Size			
Qty	Prt	T	W	L	Piece
1	A	¾"	8"	42"	straight side
1	B	¾"	7"	36"	bottom
1	C	¾"	8"	8"	stern
1	D	¾"	8"	44"	curved side
1	E	¾"	2"	44"	gunwale

The Mallet

My Little Chickadee



by Jack Ekstrom

Birds and carvers both have an affinity for wood, which may explain why birds are one of the most popular subjects to carve. Most birds can be carved life–size. Their round shapes make them comfortable to hold and easy to carve. As generations of bird carvers will tell you, it's a challenge to make them as life–like as possible.

Birds are easiest to carve when they're standing still and have their wings folded. They're certainly easiest to look at and copy to wood when in this position. A wonderful example is this chickadee by the famous Maine bird carver Wendell Gilley. The carving measures 4$^1/_2$" long, and has few carved details. Gilley finished it with paint, just hinting at the feather shapes. It's mounted on a natural branch that's screwed onto a carved base and is attached to the branch with a wood screw and a single molded bird foot. It probably only took him a few hours at most to carve, not only because he carved birds for a living, but because he has included so few details.

Many bird carvers carve every single feather on a bird, and every line on every feather, meticulously counting the number of feathers and positioning them exactly right according to the species of bird being carved. It's common to carve individual feathers, extremely thin, and place them in a bird's tail and wings. The level of realism in bird carving these days is astonishing. The remarkable thing about Gilley's beautiful carving is its simplicity. The pattern with the side, top, and front views, has much more detail than Gilley's finished carving. It's entirely up to you to decide how much detail you want. Beginning carvers will want to opt for less detail.

***Jack Ekstrom** is a writer and illustrator from Colorado and the former editor of* The Mallet, *the journal of the National Carvers Museum.*

Tools

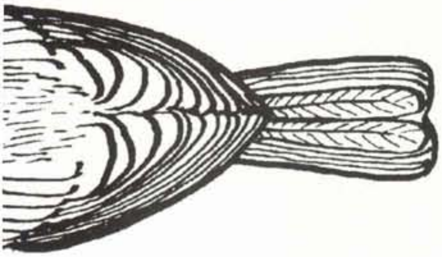
In 1978 Wendell Gilley wrote to Fred Clark at Warren Tools about the knives he used to carve his birds: "I use a couple of blades made from power hacksaw blades, beveled off—a sort of skew chisel but thinner. I just put some tape around it for a handle and it works great. I have one ground left and one right for cutting the wing grooves."

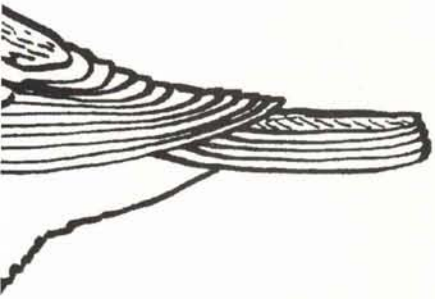
While the chickadee can be carved with a single knife, four additional tools make the job easier—right and left handed skew chisels, a broad sweep gouge for finishing under the tail, and a V or parting tool for carving feather details.

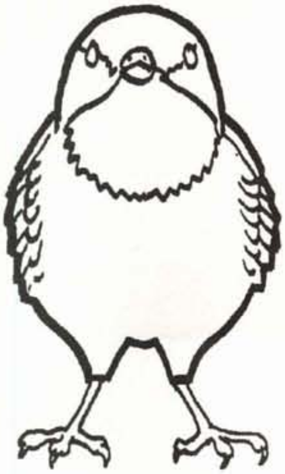
Many carvers use a woodburner to finish the details, including the fine lines of all the feathers, the eyes and the nostrils. The Hot Tool with interchangeable nibs and temperature control, is an excellent woodburner. The variety of wide nibs allows you to blacken and shade different areas of your carving.

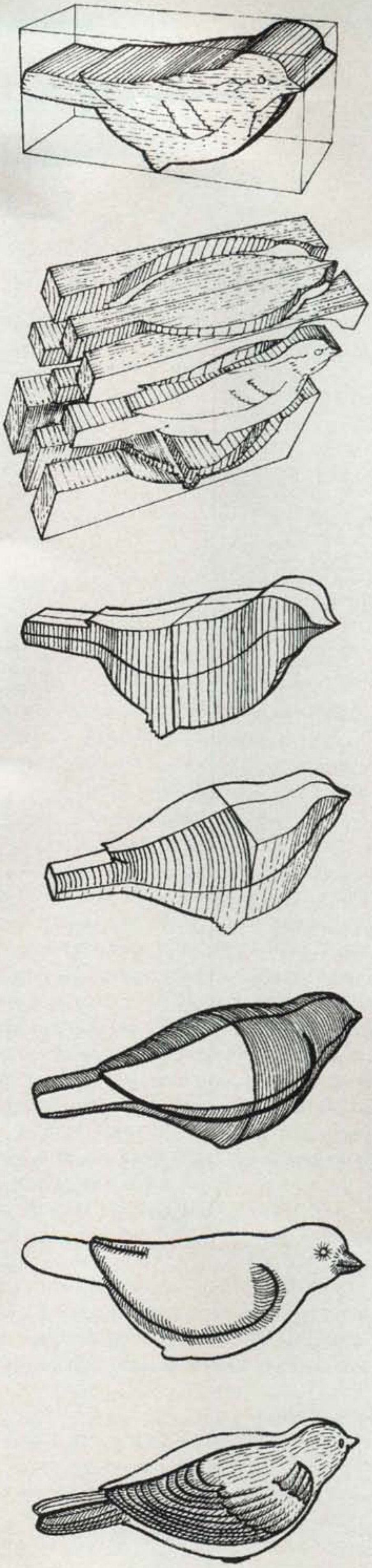
Wood Selection

Start with a piece of softwood measuring 4$^1/_2$" X 2$^1/_2$" X 1$^3/_4$". Standard 2 X 4s are ideal, but try to find one with a straight grain and test its softness with your fingernail. The original carving is from a basswood 2 X 4, and was sanded then painted. Many carvers prefer to leave their wood unpainted, finishing it only with a woodburner. In this case, use a prettier wood than pine, such as mahogany, basswood, or even cedar. Basswood









Prepare the blank, draw the center lines, then carve the blank round.

is generally the best wood for beginners to carve, and is a good wood for the chickadee because it's naturally white. You can easily color the wood with a woodburner, duplicating the chickadee's markings.

The Blank

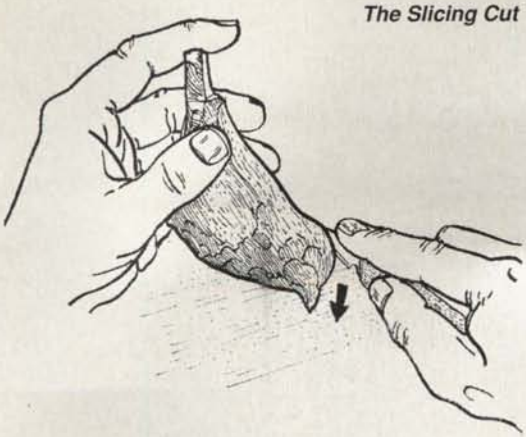
Prepared cutouts are handy, especially if you don't have a bandsaw. I prefer cutting them from a whole piece of wood. It is crucial to make the chickadee round in every dimension, so it helps to cut the side view, and also the top view. The side and top profiles are in the PullOut™ Plans. Use a piece of carbon paper and draw the side view; then draw the top view on the blank. It is important to leave extra wood at the tip of the beak, so it doesn't end up too small. It's much easier to draw the top view on a flat block of wood than on the curved top of a prepared cutout.

Saw the side view carefully so the wood you remove—the four corners—is left in four whole pieces that will fit back into place. Tape these pieces back together with transparent tape; then saw the top view. Taping the wood back together into a square block is important to properly put it back through the bandsaw, and it relieves you from having to use your knife a lot at the beginning of your carving. Beginning carvers, especially, can get discouraged at the very first step of a carving if they have to use their knife to cut the top view. It's hard enough to make the chickadee as round as it should be; the band saw is a major work saver.

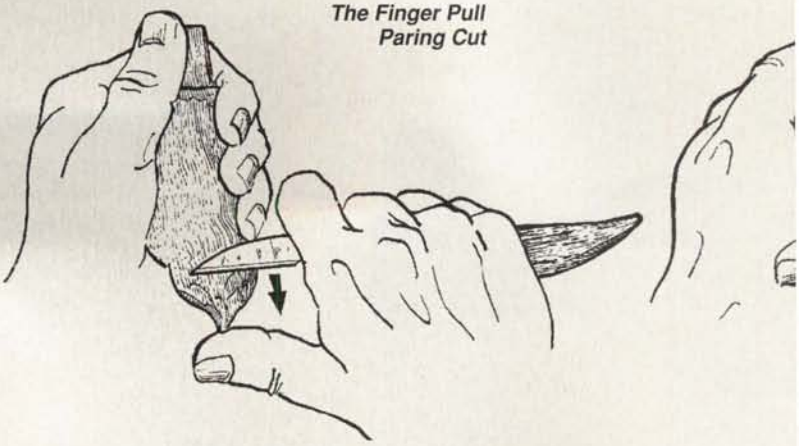
Draw three center lines around the finished cutout. One is lengthwise from the tail to the beak on the top and bottom, dividing the bird into two equal halves. This is the most important center line. The second is around the midsection, dividing the bird equally into front and rear halves. The last is located on both sides from the beak to the tail.

Carve It Round

If you are using a knife to cut the top view, be sure first that you draw



The Slicing Cut



The Finger Pull Paring Cut

SAFETY RULES

1. The safest way to carve the bird is to set one end on a table, and carve down to the table; this is especially important if you cut the top view with a knife.
2. Cut small pieces of wood at a time.
3. Never cut toward yourself.
4. With the paring cut, always keep wood between the blade and your thumb.
5. Keep track of the fingers on your other hand in relation to the blade. Keep your other hand behind the blade.
6. Do not hurry or push too hard.
7. Have a band aid at the ready.

the first centerline all around the bird. This helps you carve both sides of the bird equally. Draw the top view the best you can onto the cutout bird. Some carvers don't bother drawing the view; since the purpose is to visualize what you're cutting, you can do that anyway you want.

Use a knife and start at one corner of the bird. Remove all the wood between the three center lines and make the wood completely round. In the same way, remove the wood from all the other corners of the bird—make the blank round from center line to center line. Go around the bird until it is as round as possible. Bear in mind that by the time you're done, there won't be a flat place left. Continuously compare the carving to the patterns, photo and drawings until you're completely satisfied with how round it looks. When using a knife, the tendency is to stop carving sooner than you should. Don't stop too soon.

Types of Cuts

The safest cut is the slicing cut. Rest the beak on a wooden carving table and hold the tail end firmly. Starting on a corner of the wood and cut straight down to the table. Cut only $1/8$" of the wood or less at a time. Keep your other hand behind the knife. When using the slicing cut, it's usually easier to carve the head first, then the tail, because the tail is so thin. There are some places on the bird, however, especially on the back of the head, where it's not easy to use a slicing cut. When you cut out the side view of the bird, you made the beak larger than it needs to be. That's important now because you're resting all the weight of the bird on the tip, and you don't want the tip to break.

The bird is easy to hold, and you'll find that it's easy to pare–cut most of it, especially if you cut the top view with a saw. If you ever pared a potato, that's how you also pare the bird.

Unfortunately, paring cuts are the most dangerous. Remember the safety rules when making pare–cuts. This cut breaks the most basic rule: never carve toward yourself. You're always pulling the knife toward your thumb, and since the bird is so small, all the fingers on your other hand are near the blade. Keep a little wood between the blade and your fingers at all times.

The Finger Pull: In the basic paring cut, you pull the knife toward your thumb with your forefinger, which is hooked over the back of the knife. The wood is held firmly with your other hand, and your carving thumb is hooked securely on the wood opposite the knife or on your other hand. The blade of the knife is tightly controlled by the forefinger; the closer the finger is to the blade, the more control you have.

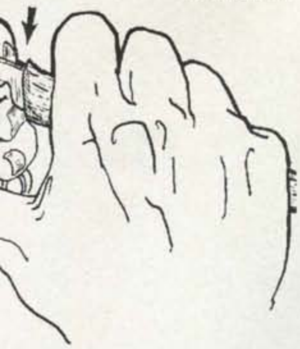
The Thumb Pull: You can cut large amounts of wood by pulling the knife more with your thumb than with your finger. This cut is used as an alternative to the slicing cut, but great care must be taken not to cut too much at a time or use too much force. The carving forefinger is held farther back from the blade than in the finger pull cut. Your thumb is hooked very firmly on the wood or on your other hand below your other thumb; a tremendous amount of leverage can be applied in this cut. Never forget where all your other fingers are, as well as the fat part below the thumb on your other hand.

The Thumb Push: It is possible to do a paring cut by pushing the blade instead of pulling it. Use this cut when trimming the tips of the wings and separating the two legs. Push the back of the blade with both thumbs, controlling it primarily with your other thumb—put one thumb on top of the other for maximum control. You can carve a lot of the head with this cut by keeping your blade flat to the carving.

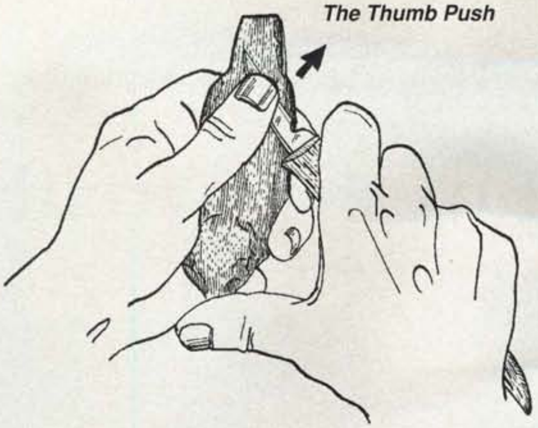
Beginning Details

As soon as you finish making the bird as round as possible, draw the lines for the bottom edges of the wings. Carefully locate each eye, making sure both eyes are equally spaced from the beak, and perfectly opposite each other.

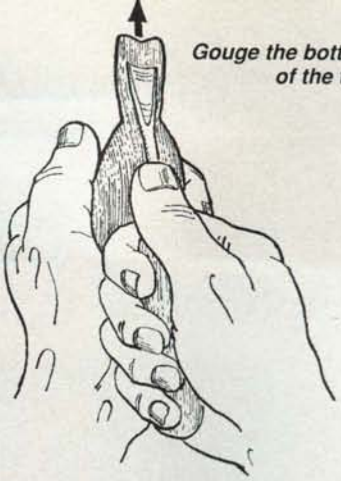
The Thumb Pull Paring Cut



The Thumb Push



Gouge the bottom of the tail.



The right and left handed skew chisels are ideal for carving these details. Hold them as you would your knife, and use both the finger pull and the thumb push to make the cuts. You'll find that both skew chisels are very handy when you go from one side of the bird to the other. Remove wood by V–cutting. First, cut the bottom edge of the wing with the tip of your chisel. Use the edge of the chisel for the second cut along the first cut and remove about 1/16" at a time. Never pry with the blade; the tip of the skew chisel is as fragile as the tip of the wood beak. Pay special attention to both.

Finish Details

You can carve as many or as few feathers as you like, put as much or as little detail as you choose. Wendell Gilley sanded his bird before this last step. But if your tools are sharp and all your cuts are clean, sanding may not be necessary—many carvers prefer tool marks to show on their carvings.

Use a V–tool to cut the smallest feathers, mainly the shallow lines on the back of the shoulders and around the head. You can also use the V–tool for the finer lines in the feathers.

Under the Tail

V–tools and gouges are meant to be pushed, never pulled. Always keep your other hand behind these tools, and make your cuts shallow and easy. When you cut the little feathers on the back and head, hold the V–tool the same as the broad sweep gouge. Rest your knuckles on the bird and push in the direction of the grain.

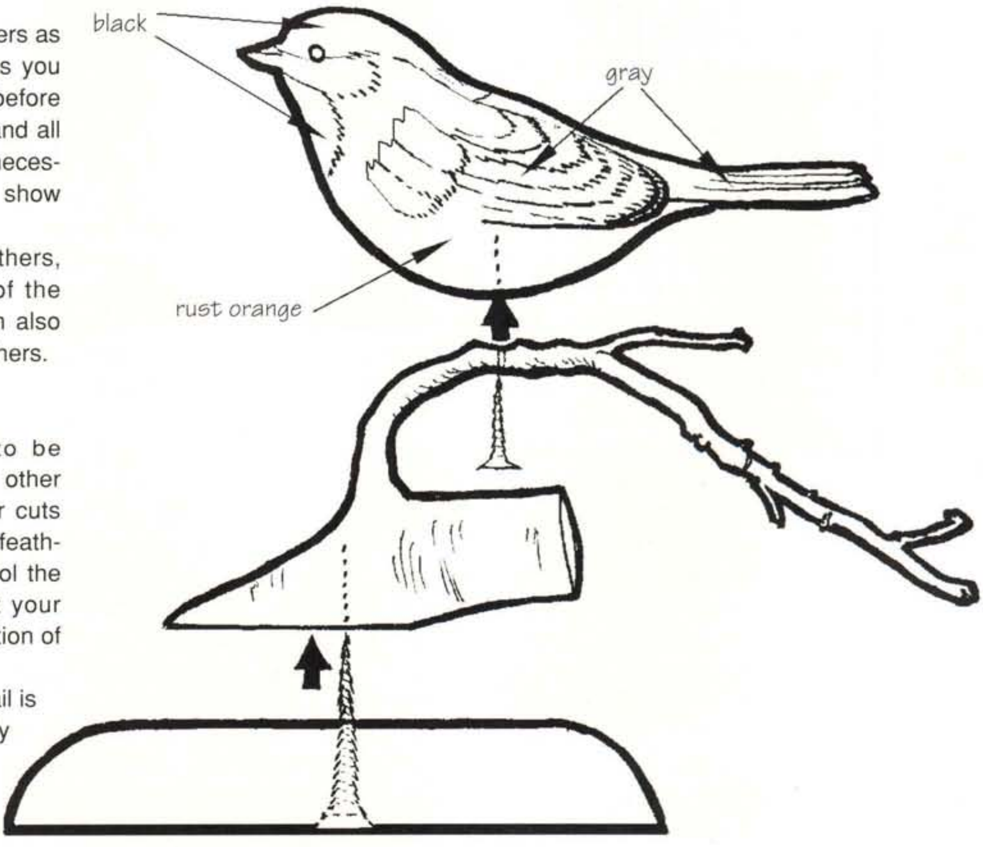
Carve the part under the tail last. The tail is curved, on top and underneath, and is only about 1/8" thick. You can carve the feathers under the tail as you did on top—Gilley left those feathers uncarved.

Finishing

Gilley painted his bird with black, gray, white and orange acrylic paints. Painting or woodburning are both attractive. Seal the wood with oil or varnish when you're done.

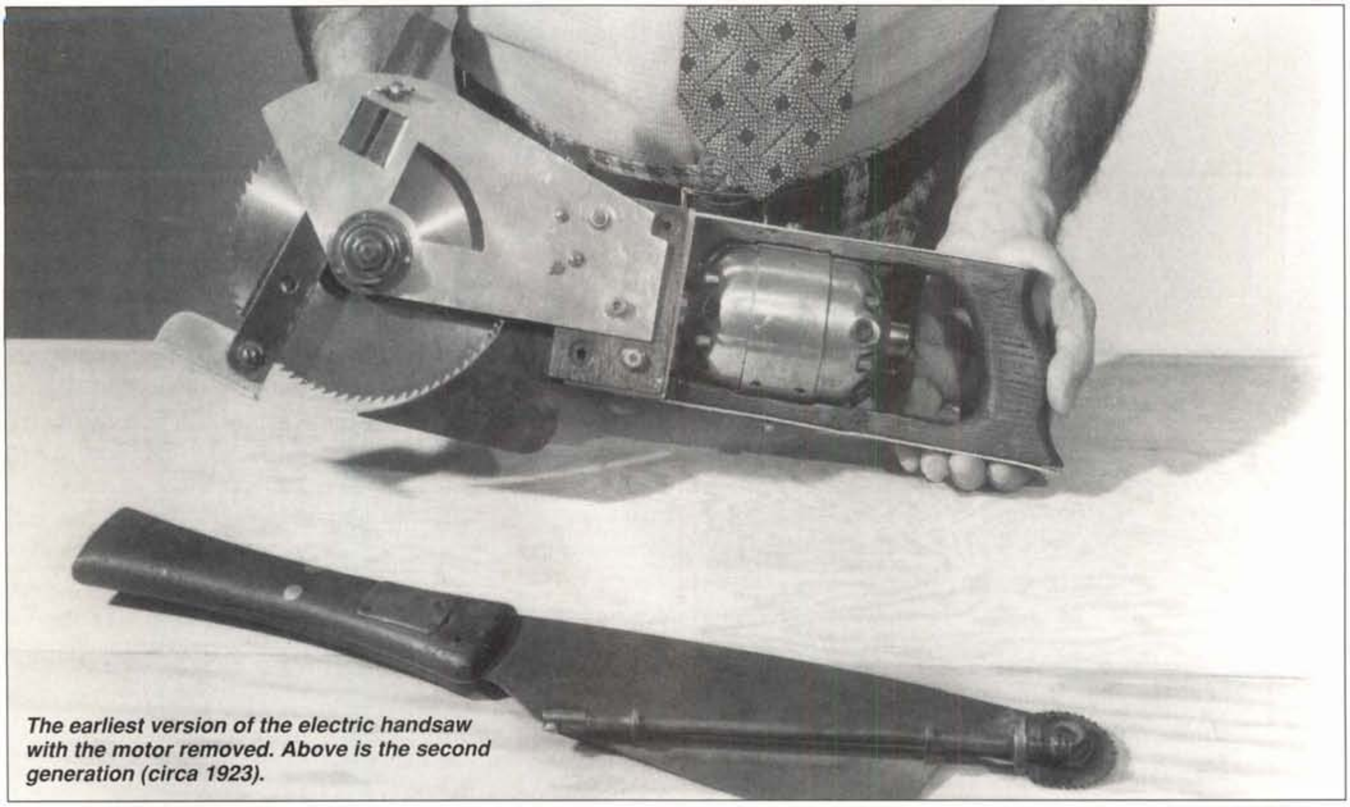
To display your carving, cut an oval base measuring 3/4" X 3" X 4 1/2". Round the top edges, and finish it in the same manner as the bird. Find a suitable branch and attach it to the base with glue and a wood screw. Drill a hole through the branch and attach the bird with a small wood screw.

Gilley's chickadee was smooth on the top and bottom, without any wing tips or legs. He did, however, add a single cast bird foot after he had secured the bird to the branch. The bird foot held no weight—it was there to show that the bird was sleeping. You can get cast bird feet from carving supply houses, or you can simply bend a light gauge wire to make it look like a foot. PW



Development of the Circular Saw

From Machete to Modern Machine



The earliest version of the electric handsaw with the motor removed. Above is the second generation (circa 1923).

by Leon A. Frechette

When you use your worm drive or circular saw (sidewinder), have you ever wondered how these handy, portable saws came about? The story is both intriguing and informative.

First The Machete

The story begins in a sugar cane field in the early 1920's. The field hands cut down the thick cane stalks using only a machete. In 1921, Frenchman Edmond Michel of New Orleans, Louisiana observed the backbreaking work and came up with an idea he thought would increase the efficiency of sugar cane production. His decision that day altered history and made life in the construction and woodworking fields a whole lot easier.

Michel took a regular machete and mounted a malted milk mixer motor made by Beech just below the handle facing forward. He installed a 1/4" X 15" shaft down near the bottom of the blade close to the cutting edge, and mounted a worm drive gearbox at the tip of the machete. This gave him a perfect right–angle drive. At the end of the shaft on the gearbox, he mounted a 2" circular blade; and near the handle, he mounted a toggle switch.

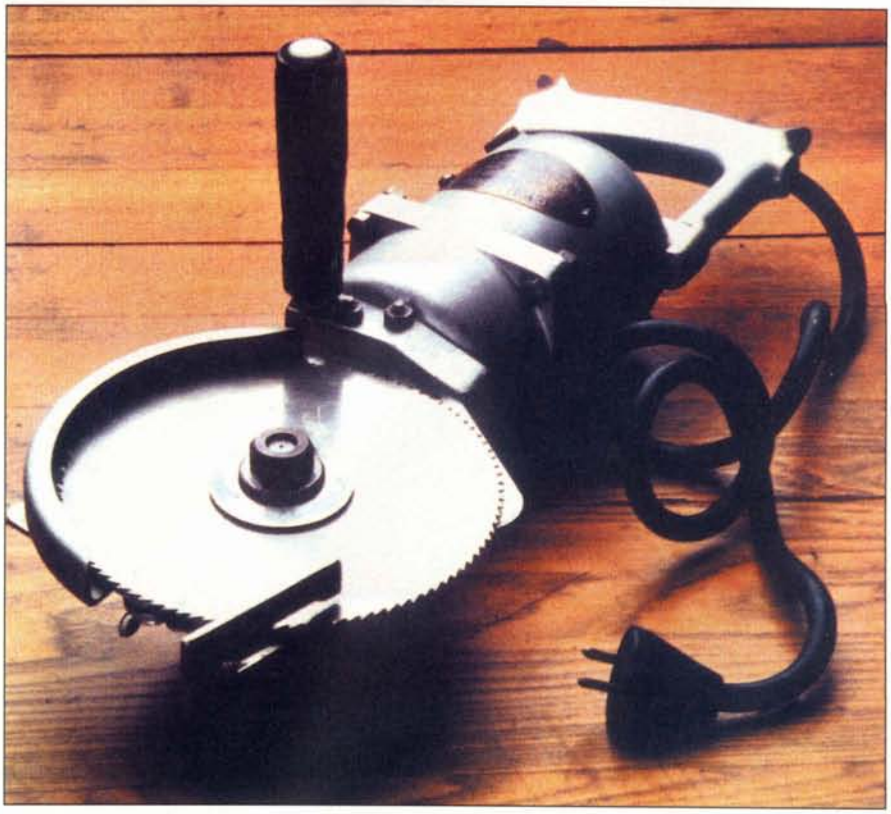
Michel had invented the first electric handsaw. But in those days, an electric generator was almost as big as a cement truck. Can you imagine extension cords stretching from a generator into the huge cane fields to power electric handsaws? Even though the concept was a great idea, the saw did not work efficiently enough to make it practical for cutting sugar cane.

Wanting to develop his idea, Michel went back to his shop. He took a piece of 1" X 5" about 12" long and cut a U–shape into it. At the back end, he made the handle. In the center, he mounted the mixer motor from the machete. Using the same principles he'd tried with the machete, he installed a shaft, worm gear drive, and a 6" circular blade. Believe it or not, this saw was able to cut through 1" thick material—slowly—but it did the job. By about 1923, Michel had an electric handsaw very similar to the worm drive we use today.

Enter The Worm Drive

A New Orleans newspaper ran a small feature article about Michel's invention. Farmland developer Joseph W. Sullivan, on his way to Florida by train, came across the article in an old copy of the newspaper. Impulsively, he changed his plans and traveled to New Orleans to find Michel. Upon seeing Michel and his makeshift unit, Sullivan became excited by the marketing potential it represented.

***Leon A. Frechette** is a writer with 20 years experience in the construction industry.*



Patented Model— The only one of this version known to exist today.

In late 1923 or early 1924, Sullivan and Michel set up a shop in the Chicago area and hired a draftsman to draw blueprints from the wooden handled model. They had an all–aluminum saw made up for testing purposes, but found it to be a little too small. They then redesigned the saw into a larger model and on January 20, 1924, a patent was issued.

Only six saws were produced, and to date, only one saw is still known to exist. The saws had 7" blades and a very narrow foot that didn't tilt. They were strictly cut–off saws and cost about $1,000 each to manufacture.

Michel and Sullivan incorporated their enterprise into the Michel Electric Hand Saw Company on July 1, 1924. Michel took three of the saws to New Jersey where the Boardwalk was under construction. Sullivan took the other three to the Los Angeles area where a large influx of people had triggered a tremendous amount of home building. Sullivan's son, Bolton, was a salesman for the company at the time. He recalled, "It was unusual for a saw to run for more than two days. They had all kinds of switch, gear and bearing problems." But in spite of the problems, contractors got involved and used them. They made recommendations and overall, were enthusiastic about these new tools.

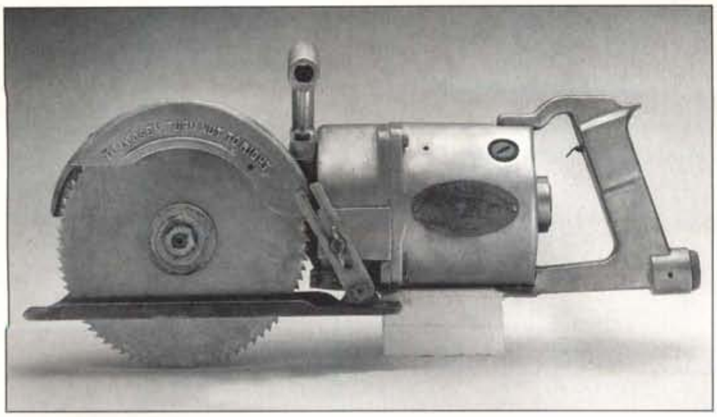
When Sullivan and Michel returned from their travels, they incorporated the recommendations and redesigned their saw. For one thing, it had to be larger. They increased the power of the motor and added an enlarged foot assembly along with a larger 8" blade. The men discussed the issue of the various types of cuts their saw might be called upon to make: cut–off, ripping, mitering and beveling, compound miter cuts, pocket cuts, etc. Mrs. Sullivan, overhearing the discussion, said, "Whoever could do that must have a lot of skill, and it takes a lot of skill to do that."

The redesigned saw, now known as the Skilsaw Model E, went into production at the Michel Electric Hand Saw Company. When it became available in California, it sold for approximately $160.

In late 1927 or early 1928, Michel expressed his desire to leave the company to pursue other inventions. J.W. Sullivan, with the help of family money, took over the company and Michel left for New Orleans.

Since Michel was no longer involved in the company, J.W. wanted to change the name. Use of the saw was increasing and it seemed natural to name the company Skilsaw. The worm drive, also called the Skilsaw Model E, was manufactured up to 1939, when it was finally discontinued.

In 1937, the first Skilsaw* Model 77 with a 7¹/4" blade was built by Edward Sterba. It was refined from the Model E.



The first model manufactured under the Skilsaw name.

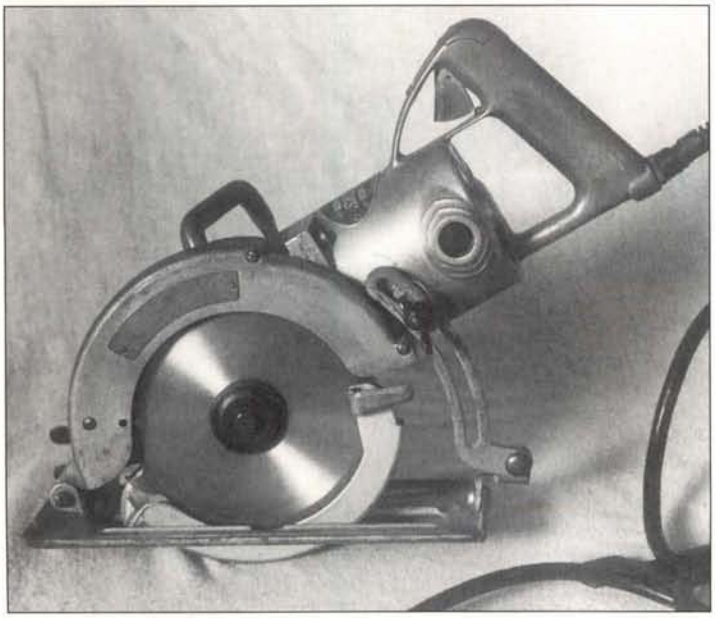
Amazingly, the price for a Model 77 has not changed much over time. A unit cost $105 in 1941 and today, the saw is about $140.

The Sidewinder

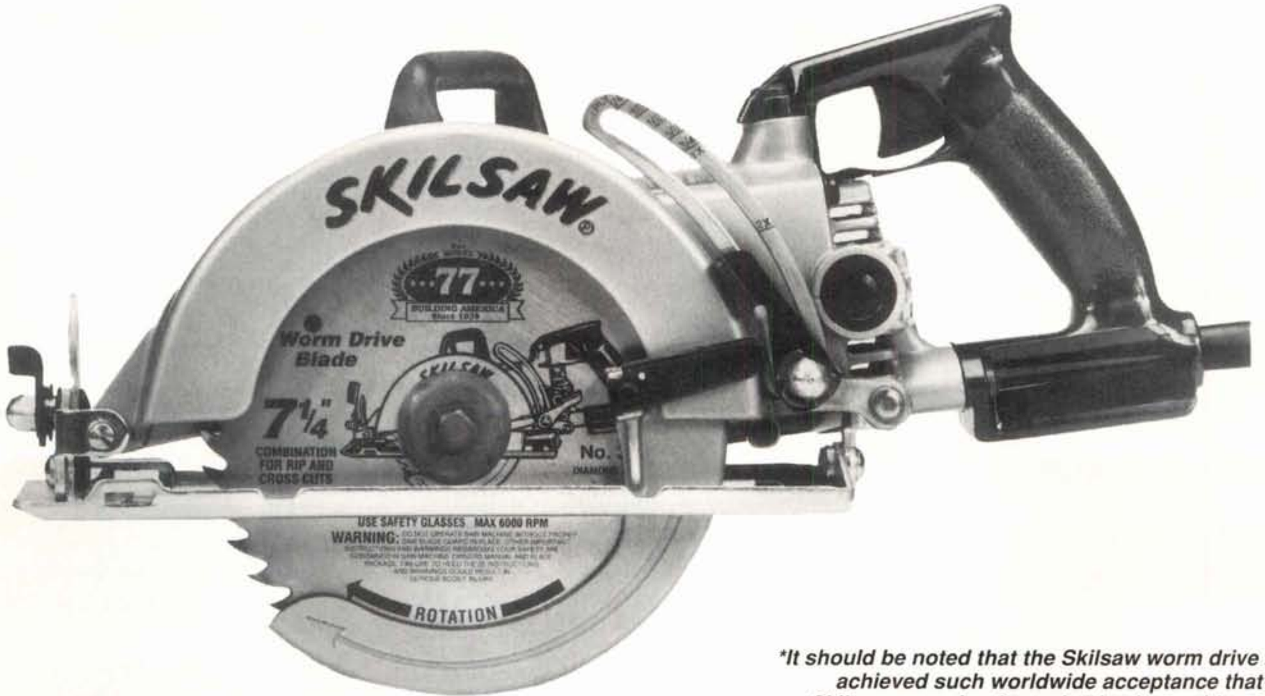
Because the original worm drive saw was protected by a patent, other tool manufacturers worked on and developed an in–line motor version where the motor shaft is perpendicular to the blade. The motor drives a spur gear–set to reduce the speed of the saw blade.

The initial test saw had the motor mounted on the right side of the blade. Manufacturers hoped to keep this configuration, which was similar to the worm drive saw, so a right–handed user could see the blade and the line of cut. This setup allowed the user to make very intricate cuts by eye. However according to Edward Sterba, motors at that time were as big as coffee cans and were very heavy. As the saw approached the end of a cut, the weight of the motor would cause the saw to drop down and off to the right. This often caused the wood to split or crack.

The failure of this design prompted the manufacturers to move the motor to the left side of the blade. Now during a cut, the weight of the motor would sit over the material. This design became



The Model 77— yesterday (1952) and today. (Photo courtesy of Dick Jarmon.)


SKILSAW®
77
BUILDING AMERICA
Worm Drive Blade
7¼"
COMBINATION FOR RIP AND CROSS CUTS
No.
USE SAFETY GLASSES MAX 6000 RPM
WARNING:
ROTATION

It should be noted that the Skilsaw worm drive has achieved such worldwide acceptance that the Skilsaw name is often mistakenly used for other brands and styles of portable circular saws.

known as the sidewinder or top handle circular saw. According to my research, Arthur N. Emmons invented the sidewinder in 1926. Emmons started working for Porter–Cable, a division of Rockwell Manufacturing Company, at their Syracuse, New York location in 1919, and in 1923, became the chief engineer.

During World War II, Skil developed a circular saw for military applications. They replaced their electric motor with an air–driven Thor motor on the 12" worm drive saw. This saw was used in all types of construction and worked in all types of environments—even underwater to cut piles or timbers. A requirement for tools during wartime, the PS-12 was manufactured in camouflage colors; the blade was black and the body a greenish color.

Working with the Navy, Skil put this saw into a special camouflage box coated and sealed with plastic. When they were unable to get into a landing area, the unit would be dumped overboard and floated or dragged in for use on aircraft landing areas.

Even though I discovered information on circular saws dating back to 1777, I found the following reference quite interesting. According to *Women, Technology and Innovation*, (Pargamon Press, 1982, Joan Rothschild, Editor), the invention of the circular saw blade is attributed to a Shaker inventor, Sarah Babbit of Massachusetts. Apparently, in 1810 she made and attached a notched tin disk to the spindle of her spinning wheel and successfully cut a piece of single. Out of this crude beginning developed circular saws and blades.

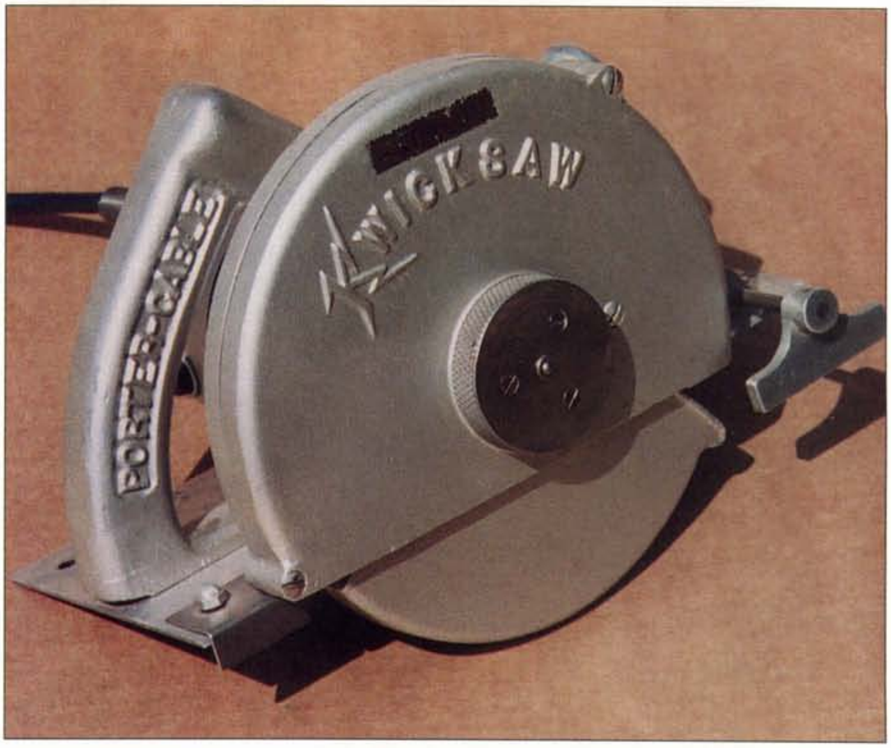
Sidewinder or Worm Drive?

I've always wondered why contractors on the East Coast use sidewinders and on the West Coast they prefer the worm drive saw. As I discovered, it was the location of the manufacturers and their distribution channels that caused the distinction. Since the Skilsaw worm drive was made in the Midwest, it was sold on the West Coast where they had already established a market. The sidewinder was developed in the East by at least four different tool manufacturers, of which Porter–Cable was one. During this period, distributors only carried one company's products, so the sidewinder became a routine addition to the Eastern distributor's line.

Today, distribution and retail do not operate the same way. I live on the West Coast and I use both saws: the sidewinder for finish work and the worm drive for framing. PW

Author's Note: Edward Sterba, who started with Skil in 1937, is still alive. He had the opportunity to meet Edmond Michel and knew the Sullivan family quite well. Michel and the Sullivans have passed on. Mr. Sterba is now retired. He was very helpful in sharing firsthand accounts of historical information for this article. Dick Jarmon, a good friend of Arthur H. Emmons, supplied the information on the circular saws. Emmons retired from Porter– Cable and passed away last year.

Kwicksaw—This 1928 Model K-7 was produced by Porter–Cable in Syracuse, NY. (Photo courtesy of Dick Jarmon.)



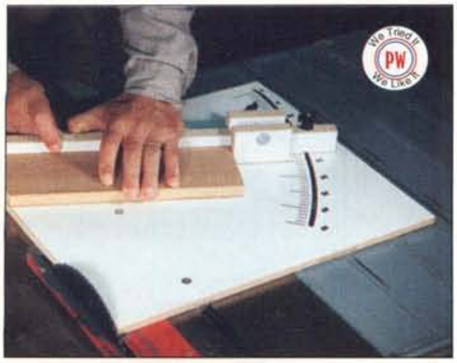
News and Notes

New products to announce? Send a press release and a color photograph to the Editor, *Popular Woodworking*, 1041 Shary Circle, Concord, CA 94518, and we'll consider them for "News and Notes."

Brink & Cotton® Stand–up Clamp Pads from Warren Tool Group fit all ¾" pipe clamps and eliminate the need for clumsy and unstable wood blocks, separate pads and saddles. They provide a hands–free, standing pipe clamp. The one piece pads protect work surfaces from the clamp jaws and elevate and stabilize the pipe clamp for easy accurate clamping. Warren Tool Group, PO Box 286, Garrettsville, Ohio 44321. Tel. 800 543-3224.

The new C8FB2 Sliding Compound Miter Saw incorporates a redesigned retractable guard which automatically adjusts to the thickness of the material being cut and lowers to cover the blade when not in use. The vise and slide fence are included as standard accessories. Produced In the U.S. by Hitachi Power Tools U.S.A. Ltd., 3950 Steve Reynolds Blvd., Norcross, GA 30093. Tel. 404 925-1774.

The Steussy Angle–Slide system gives your table saw an 18" miter dial mounted on a 19¼" X 16" table slide. The easy to read dial lets you get the exact angle setting to cut your work pieces with no guessing. You can handle small pieces with a greater degree of safety and larger pieces get the support they need from the large sliding table. A stop mounts to the miter arm for accurate repeat cuts. Available from Woodworker's Supply. Tel. 800 645-9292.



This dedicated hollow chisel mortiser from Delta is solidly built from cast iron and steel. With a fully adjustable fence and hold-down assembly, it can accommodate work up to 4" thick—5¾" with an accessory height adjustment. The column and head can be rotated 180° for off–table operations. The geared rack and pinion head is raised and lowered by a spring–loaded, multi–position feed lever that's adjustable at six 60° increments to give the user a choice of pull–down positions for more comfort and less fatigue. The unit comes with a tool holder, predrilled mounting holes and two–year warranty. For the name of a nearby Delta distributor, call 800 438-2486.

The Panel Express can transport three sheets of ¾" plywood at a time. With 10" pneumatic tires, the cart won't stumble over extension cords, air hoses or scrap lumber and its small size give amazing maneuverability. The weight of the panel moves a self adjusting brace into position to secure the sheet in place. For information contact: Saw Trax Mfg., PO Box 1170, Kennesaw, GA 30144. Tel. 404 424-3046.

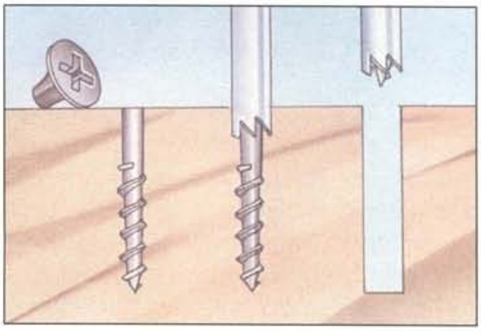
This new countersink from Amana, the makers of fine router bits and shaper cutters, is carbide–tipped. Available in various sizes, each includes a HHS pilot drill. Unique in the fact that all four countersinks have the same outside diameter, a single matching HHS plug cutter is all that is needed. Amana Tool Corp., 120 Carolyn Blvd., Farmingdale, NY 11735. Tel. 800 445-0077.

The Power Carver features a reversible ¼ HP, variable speed, flexible shaft power carving motor. It can remove large amounts of stock rapidly with precise accuracy. The unit is great for left handed carvers. The system includes a variable speed foot control (500 to 15,000 rpm), and two compatible handsets: one with a drill (0" to 5⁄32"), and the other with a collet that accepts ¼", ⅛" or 3⁄32" shank standard cutting tools. PSI Woodworking Products, Comly and Caroline Roads, Philadelphia, PA 19154. Tel. 215 677-6374.

The Rocking Horse Shop now provides the plans, kits and all the accessories you need to reproduce these beautiful English, Victorian Style rocking horses. The plans are detailed and informative with instructions and photographs. The accessory package includes top quality leather and horsehair and cast brass hardware. For a catalog contact: The Rocking Horse Shop, 8 Spring Street, St. Jacobs, Ontario, Canada N0B 2N0. Tel. 519 664-1661.

Made of injection molded polypropylene, the Storehorse is a sturdy, lightweight, portable and easily stored folding sawhorse. The bottom shelf slides up on pins into the leg to give a folded width of only 2". Weighing only 12 lbs, it can support 500 lbs. The Cord n' Plug accessory contains six outlets and a 12' extension cord. It attaches between the leg and doesn't inhibit folding. The top tray protector covers and protects the top tray from saw cuts and provides a 30" measuring stick. Also available is a 20" X 30" work surface that attaches to either of the legs without using screws or nails. Storehorse, 16607 Blanco, Suite 100, San Antonio, TX 78232. Tel. 210 492-8908.

The Sure–Grip Clamping System features smooth acting, one hand clamping with a reversible thumb clamp for left or right hand use. Two single clamps can be easily joined and used as a double–sided clamp. in this configuration you can secure work to a bench top or saw horse for finishing. They are available in lengths of 20", 30", 42" and 56" in both single and double–sided models from Trendlines, 375 Beacham Street, Chelsea, MA 02150. Tel. 800 767-9999.



If you didn't use Beezwax™ to lubricate the threads on the screws first, you may find yourself in this position. Screw extractors cleanly cut and lift out the wood immediately surrounding the broken screw, leaving a perfectly round hole that is easily filled with a dowel—a solution with minimal impact on the project's appearance. Beezwax™, which won't stain the wood or introduce moisture that can cause corrosion or mildew, and screw extractors are available from The Woodworkers' Store, 21801 Industrial Blvd., Rogers, MN 55374. Tel. 800 279-4441.

The top industrial brands of dust masks, goggles, ear plugs and gloves that are used on the job, are now available on a consumer level in the Workshop Safety & First Aid Kit from Miracle Point. The kit also includes the unique Magna–Point Tweezer, a super precise tweezer with an adjustable 5x power magnifier, along with a generous supply of basic first aid items. Miracle Point, PO Box 71, Crystal Lake, IL 60039. Tel. 800 682-4256.

Tool Talk *by Sanford Wilk*

Finish Nailers

Judging by the popularity of power nailers, it's hard to imagine that those who now swear by them once swore at them. Today, nailers are available in many sizes and shapes and are well within the price range of the home hobbyist. Finish nailers from both foreign and domestic sources are available from many manufacturers and resellers. They range in price from less than $200 to over $800. We have chosen to review finish nailers because they're one of the more versatile nailers. These tools accommodate nails from ¾" up to 2¾" in length and in gauges ranging from 16 to 14. The uses for these tools range from applying decorative moulding, mounting baseboards, window casings or crown moulding to all forms of fine woodworking.

Picking a finish nailer that's right for you may not be easy, and a single tool may not suit all your needs. We'll try to take some of the mystery out of the tools and point out safety tips where applicable.

Anatomy of a Pneumatic Nailer

What do a pneumatic finish nailer and an old locomotive steam engine have in common? The engines in both operate on the same principals. A high–pressure medium drives the piston back and forth in a cylinder. In a locomotive, the medium is steam; in the nailer, it's compressed air. The implementation of the engine in a pneumatic nailer is a little different from the steam engine because of the application—nailers only require power in one direction.

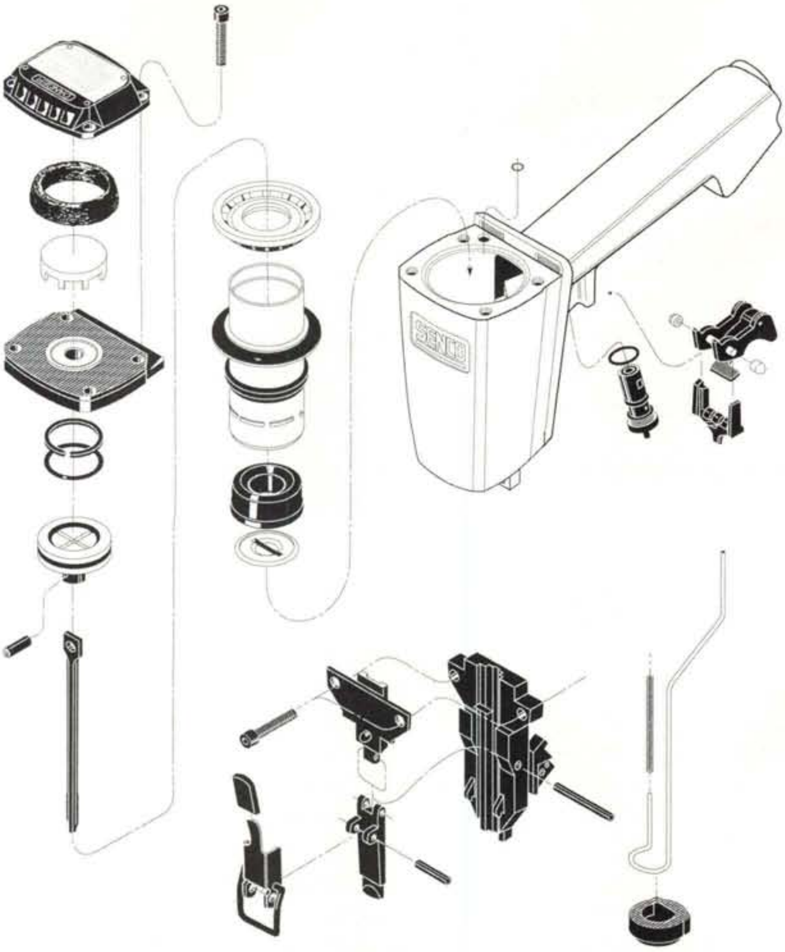
The pneumatic finish nailer contains a series of three pressurized chambers, a high–pressure reservoir, the cylinder and the return chamber where high–pressure air is sequenced to drive the fastener. The high–pressure reservoir, is the hollow chamber in the handle of the tool and is pressurized by a compressor through a high–pressure hose. The reservoir ensures that enough air is available to flood the cylinder and drive the piston. This reservoir acts like the water tank on the back of a toilet. If a pneumatic nailer doesn't have this cylinder, the air would have to be supplied directly from the air hose. The internal diameter of most air hoses is typically ¼" to ⅜" and can't deliver the volume of air required to power the piston with enough force to drive a fastener.

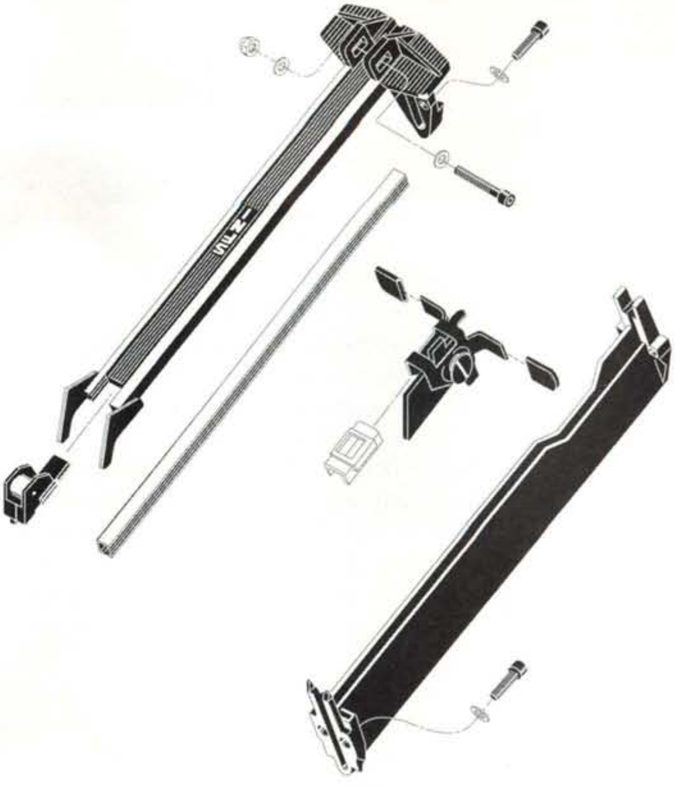
The cylinder is the second stopover for the pressurized air on its trip through the nailer. When the safety mechanism—the contact tip—is depressed and the trigger pulled, the head valve opens and allows the air in the high–pressure reservoir to rush in. The head valve is controlled by the trigger and allows the pressure built up in the reservoir into the cylinder. At first, the volume of the chamber is small because the piston is at the top of the stroke and it's vented to the outside of the tool. When the head valve opens, high–pressure air fills the chamber and it exerts pressure on all sides of the chamber. The walls of the cylinder don't move, but the piston, does. The pressure on the piston is much greater than the forces trying to hold it back. The forces resisting the travel of the piston are the pressure exerted on the nail as it enters the wood and cylinder wall friction on the piston. Oil lubricates the cylinder walls reducing friction and extends the life of the O–rings.

The piston continues to move down until it hits the bumpers at the bottom of the cylinder. This is as far as the piston can travel, and the extent to which it can drive the nail on the other end of the drive pin. The drive pin is connected to the bottom of the piston and acts like the connecting rod in a car engine. At the end of the cylinder there are two rows of holes in the cylinder walls. One row is on the inside of the chamber and the other is on the opposite side of the piston head. As the piston reaches the end of its travel the first row of holes is exposed and air starts to rush out and into the return chamber.

As the return chamber starts pressurizing, the second set of holes allows the back side of the piston to pressurize, since both sides of the piston need to be equalized. The piston is no longer between high and a low pressure regions, stopping forward motion. When the trigger is released, the head valve closes and the cylinder opens, allowing the high–pressure air to escape. Since the pressure had been equal on both sides of the piston with the head valve open, the pressure situation is reversed and the piston is pushed back towards the head valve, ready for another cycle.

***Sanford Wilk,** a builder and organic architect in Boston, Massachusetts, heads a team of craftsmen who evaluate tools under actual working conditions.*





The Pneumatic Finish Nailer

Anatomy of a Cordless Finish Nailer

There is another similarity between the air nailer and the steam engine—competition from the internal combustion engine. We don't see the pneumatics relegated to museum pieces in the near future, however, airless nailers do give them a run for the money. One new comer to the power nailer market is the Impulse cordless finish nailer from Paslode. The concept is similar to the pneumatics. Energy is stored in the handle in the form of a fuel cell and a rechargeable nickel–cadmium battery. The fuel cell contains MAPP gas. When the contact tip is depressed against the work surface the cylinder fills with a fuel and air mixture. When the trigger is pulled a spark is fired. The spark ignites the mixture in the cylinder and the burning mixture expands, driving the piston down the cylinder. This is the same as a car engine, but instead of the connecting rod turning a crankshaft, the drive pin forces the fastener into the work.

The Nose Piece

The nose piece plays an important role in a power nailer's operation. First, it holds the nail so the operator doesn't have to. This frees up a hand to hold the work piece in place. Secondly, the nose piece keeps the fastener aligned with the drive pin. Most nails bend when using a hammer because the force is not all in the forward direction. The sideways components of the hammer blow cause the nail to bend.

Occasionally, a nail bends inside the nose piece and gets stuck. These jams, although, infrequent, are annoying and clearing them can be time consuming. The steps required to clear a jam are to first disconnect the tool from the power source, remove the front cover of the nose piece, clear the jam and then replace the front cover and reconnect the power source. You should always disconnect the power source before you attempt any service or re–loading. Accidents can't happen if the nailer can't fire.

Removing and then replacing the nose piece is the most time consuming part of the process. The covers are either held in place by screws, a spring clip or a latching lever. The latching lever is the easiest to clear. A spring loaded lever holds the hinged nosepiece shut on one side. To open the nosepiece the lever is actuated and the front door opened. After the jam is cleared, the door is shut and the latch holds it. Both the Paslode units we evaluated had this latching lever and by far were the easiest to open and close.

The spring clip is almost as simple. It also has a lever that is connected to a spring attached to the access panel, however, some degree of fumbling with this panel is necessary to move it out of the way. Once it is unlatched and moved, the jammed fastener can be accessed. Although not as easy as the latching lever, it's much easier than removing screws.

There are several different screw designs used to hold the nose piece on. These range from one screw and a hinged panel on the Hitachi NT65A, to four screws like many of the nailers. The Hitachi is actually easier to open than the spring clip type. The most common configuration uses two screws which only need to be loosened for the front panel to slide forward and be removed. Only two of the nailers we evaluated, the Airy ATF–0350 and the Woodtek 864–374 had a place to store the hex keys needed to service the tool.

Firing

Finish Nailers come with three different types of firing mechanisms: trigger–operation, contact–trip, and sequen*tial–trip*. For this evaluation we only considered the last two types. Trigger operated nailers don't have any safeties associated with the trigger and don't conform to ANSI standards. Some users say the safety tip dents soft woods. However, we feel that sanding the dimple out of a piece of molding is easier than sanding out the depression left by a hammer and much less of an annoyance than removing a fastener from your finger. Because of the lack of any safety features on trigger operated nailers, we didn't include them in this evaluation. We don't recommend them, and in fact strongly recommend against them.

Contact–trip operation is the most common as well as the most versatile. Most finish nails need to be accurately placed. The tip is positioned over the desired entry point and the safety tip is depressed. When the trigger is pulled, a fastener is driven into the work. The trigger is released and the nailer is removed from the work. The second mode of operation is used when speed is of greater importance than accuracy. Multiple fasteners can be fired when the trigger is held in and the tip is bounced on the work. With the work held in position, pull the trigger and place the tip on the work—the nailer will then fire a fastener into the work. If multiple fasteners are to be driven, keep the trigger depressed and touch the tip of the nailer to the work as desired. This is best done with a bouncing motion using the recoil to aid in lifting the gun off the work. This reduces the chance of multiple fasteners being driven at the same point.

Sequential–trip gets its name because a particular sequence of events has to occur before the tool will cycle. This type of trip is particularly nice when precision placement of fasteners is important. It also eliminates any chance of a second fastener being fired as the gun is removed from the work. The sequence of events required for this nailer is, the contact tip has to be depressed on the surface of the work and then the trigger is pulled to fire a single fastener. If the trigger is held in when the nailer is lifted off the work and then touched back down it will not fire until the trigger is released and a new cycle begun. This type of trip mechanism is the safest to have on a power nailer. Only two of the tools that we reviewed had this type of trigger. These were the Stanley/Bostitch N60FN–2 and the Paslode Trimpulse.

Magazine

All the features that we've discussed up to now are applicable to all power nailers. The size may be scaled depending on the application. The size of a piston sufficient to drive a brad can't handle a 16d nail for a framer. The head of a roofing nail won't fit into the nosepiece of a finish nailer. For our purposes, we are concerned with finish nailers only. The generally accepted classification for finish nailers is that it's capable of driving a 14 through 16 gauge nail at least 2" long. A few of the nailers we reviewed use 18 gauge nails.

Finish nails come collated in two ways. First, there are wire nails with a head that looks look a T that are glued together into a straight clip. The second style is clip headed nails that are collated at an angle. The heads on these fasteners are more like traditional finish nails, but the head is flattened on one side to allow it to lay flat against the nail next to it. The angled nailers that we evaluated came in two different angles. The majority use the 30° collation like the Senco nailers. However, Bostitch and the Atro/International Stapler use a different collation angle.

Straight collated nails are cheaper than angled nails and can be used in most of the same applications. However, straight nails must be fed straight into the chamber. This means the magazine forms a 90° angle with the nose piece. Angled nails are fed in at an angle and the magazine forms an angle less than 90° with the nose piece. In the case of the Senco, the angle is 60° and this nailer can get into tighter spaces than straight nailers.

Magazines are either open or sealed. Sealed magazines protect the nails from dust and dirt that may get into the magazine and cause the tool to jam. A problem with the sealed magazine is that the operator can't tell when the tool is about to run out of fasteners. Some sealed magazines have a small hole to view the clip, but it gets annoying when you have to keep looking to see when and if you are about to run out of nails. The open magazine allows for a quick and convenient assessment of the number of fasteners left. Tools with open magazines also tend to be a little lighter since less material is needed. The drawback is that the fasteners are exposed to dust and dirt that tend to build up and cause a jam.

Nails are fed into the chamber by springs in the magazine. Coil springs are either stretched or compressed to exert a force on the chamber. They are typically the strongest and have the lowest incidence of missfeed. The other type of spring is like a metal tape measure. These are more compact than the other springs, and tend to be less strong.

What's The Right Nailer For you?

That depends on the type of work that you're planning to do. If the primary applications are base and case (baseboard, window and door casings, and moulding), then a nailer that will drive up to 2½" nails is best. To get sufficient purchase from the nail after going through ¾" of molding and ½" of wall board, greater length is necessary. Putting up baseboard doesn't call for a great degree of accuracy, but speed is important; the contact trip would be the correct choice. The choice between a straight and an angled nailer is a personal preference. The angled nailer can be less awkward to use, particularly with crown moulding.

If the majority of your work is cabinetry, then a 2" nailer may be more appropriate. Building up or applying moulding where there isn't an extra ½" of wallboard, negates the need for the extra length. The 2" nailers typically handle shorter fasteners than the 2½" models. This is a benefit when driving through thin pieces of stock where a longer fastener would protrude through the other side. 2" tools tend to be lighter, making it easier to manipulate in awkward positions. A sequential trip is nice for these applications since accuracy is more important than speed in cabinetry. It's more difficult to hide a big hole from a double fire in a piece of hardwood trim than it is on a baseboard that will be painted.

The Kit Box

Other Things to Look For

Kit Boxes—Some nailers come as a kit in a carrying case with nails or a place for nail storage, safety glasses , oil, and in some instances, spare parts. These boxes are convenient to keep the tool, accessories and nails together. If the nailer stays in the shop, the kit provides easy storage and keeps the necessary items from roaming. If the nailer travels to and from job sites it not only keeps everything together and makes carrying easier, it provides an important safety function. The nailer is a series of pressurized chambers and any damage to the body of the tool could result in weakened areas that may eventually leak or possibly cause the tool to explode under normal operating conditions.

Safety Glasses—You can't have too many safety glasses. Many of the nailers we reviewed included a pair as a standard accessory. We wish they all did.

Oil—Since lubricating oil is something that must be used every day, it's nice to have a handy supply. When the small bottles run out, they can be refilled from the larger size.

Spare Parts—How easy is it to get spare parts? How much downtime will you experience waiting for parts? A few of the Taiwanese models we looked at came with space for O–rings and piston/drive pin assemblies.

Test Criteria

We really put these nailers through their paces in this evaluation. To start the test, we unpacked each nailer and read through all the materials that came with the tool. We then followed the manufacturers' instructions on preparing the tool for use.

We used a Sears model 919–15345 2½ hp pancake compressor and connected the nailers via 25' of 5/16" id hose rated at 200 psi. A ¼" quick disconnect was installed in any nailers that weren't supplied with one. For fasteners, we used the nails that were supplied with each tool. If nails of the maximum length for the tool weren't supplied, we used Senco 2" or 2½" for the angled nailers and Interchange Brand™ nails for the straight nailers.

With each nailer, we drove 500 nails into 2 X 4's. We evaluated the trigger mechanism and if it fired consistantly. We tested the tool trip mechanism, how it handled in different directions and for left and right handed operation.

After getting a good feel for the tool, we tested it on 12/4 quarter–sawn red oak. We tried each nailer in the oak with the pressure set at 100 psi. This was the maximum pressure that all the tools could take. With the compressor fully charged, we drove the maximum length nail for each nailer into the oak.

To evaluate the tools performence on softer woods, we drove the maximum length nail through a piece of pine trim and into a 2 X 4. We were interested in any marring of the wood surface and the looks of the entry hole.

Rating nailers on ease of clearing jams is something we spent a lot of time thinking about. If we waited for each gun to jam, we could stil be testing. We could have forced a jam by firing a fastener on top of another fastener or into a steel plate, but decided not to because it isn't safe. We assumed it takes the same amount of time to clear a jammed fastener regardless the model and that the only difference would be the time it takes to open the tip and put the unit back together.

The Nailers

We tried to make this evaluation as comprehensive as possible. Although not all the finish nailers or manufacturers are represented here, we tested 28 tools for this evaluation.

Airy ATF 0350 This nailer is one of the best. It certainly has more features than the other entries. The clear magazine cover lets you see how many fasteners are left and it can be flipped open in case of a jam in the magazine. The tools required to maintain and adjust the nailer are stored in a compartment on the back of the magazine. The magazine also has accessory attachments and calibrations that allow the user to set fasteners at a specific spacing from each other or from an edge. It also has an attachment to set the tool at a particular angle so the fasteners are always set at that angle. To top it off, the ATF 0350 comes in a convenient carrying case with everything you need except safety glasses.

Airy ATF 0365 The ATF0365 is a straight nailer that looks like the Haubold nailer. Unfortunately the similarities end there. This nailer is weighted towards the front which throws the balance off. It doesn't countersink the fasteners very deep nor does it leave a particularly clean hole. We did like the exhaust that can be redirected. One feature we *really* didn't like is the lever that switches the tool from a contact–trip to trigger operated.

Airy ATH 0565T The ATH0565T is a good entry level finish nailer. It passed the 12/4 oak test. On pine there was no noticeable marring. The entry holes could have been a little cleaner, but this isn't a big problem. The ATH0565T falls in the middle of the weight range for angled nailers. The balance of the unit was fine and the trigger was comfortable. It has some features typically found on more expensive tools like a spring clip for quick access to a nail jammed in the chamber. Overall, it represents a good value in a finish nailer.

Atro/Int Staple MONZA64 This unit features an adjustable drive depth similar to the Bostitch Dial–A–Depth. The quick release nose piece makes clearing jams a cinch. The nailer did very well in the oak test, and the pine molding was unscathed by the contact tip loop. The feel and handling of this tool is like a sports car and if someone could use sexy to describe a finish nailer the MONZA64 would fit the bill. To make the nailer even nicer, the word on the street is that Atro will introduce an oil–less version in April of '94. Atro fasteners are now being distributed by Georgia–Pacific ending what had been an availability problem. To find a local dealer in your area for Atro fasteners call 800 BUILD–GP.

Campbell Hausfeld NB0065 The NB0065 from Campbell Hausfeld is a complete nailing system. Nails come in boxes with a color coded stripe that matches the color stripe on the nailer so you can be sure to get the appropriate nails. This unit flush drives nails with painted heads so they don't need to be countersunk and filled. The nailer also has a great feel and balance. It marred the surfaces around the nail—even on oak—which is one thing we didn't like.

Dayton 6W531 The model 6W531 is a nice 2" straight nailer from Grainger. The long handle allows even the largest hand to comfortably hold the tool. The geometry makes it nicely bal-

anced. The narrow profile head makes up for the visibility lost because the contact tip is on the front of the nose piece. The sealed magazine keeps the fasteners free of dirt and grime that can cause jams.

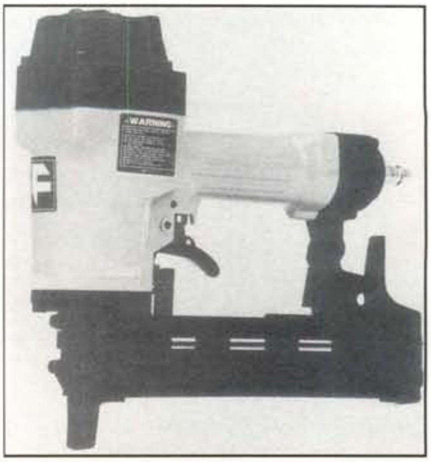
Dayton 6W533 The 6W533 is visually non–distinctive in its machine tool gray color. However, when attached to an air hose it becomes a rather powerful nailer. This tool had no problem driving 2½" fasteners and countersinking them into the red oak. The entry hole was a little larger than some, but it was clean and could be easily filled. The tool was comfortable to hold and nicely balanced. The coil spring on the magazine that feeds the nails into the chamber was the strongest of any of the tools. This reduces the chances of the clip not feeding into the chamber and thus resulting in a misfire.

DeVilbiss AFN5 The AFN5 took a little getting used to. This angled nailer, unlike any other we tested, has the contact trip set so when it is flat on the surface it drives the nail at an angle. This makes for excellent target location. The nailer can drive a nail into the oak, but when held perpendicular to the surface, it doesn't perform as well. The AFN5 is also awkward to use in the contact mode since it requires a forward and downward motion.

Duo–Fast HFN–880 The Duo–Fast HFN–880 was the heaviest unit tested and the most powerful. It had the easiest time driving a 2½" nail into the 12/4 oak and the least

amount of recoil. This is probably a result of the weight. The contact tip is a large rubber block and didn't mare the pine. How-ever, its size and position in front of the nose make locating the nail difficult. This would not be a problem once you're accustomed to the tool. The handle has a nice rubber grip and makes holding the tool a lot more comfortable than the cold cast handles on most. Duo–Fast also offers aluminum and stainless fasteners.

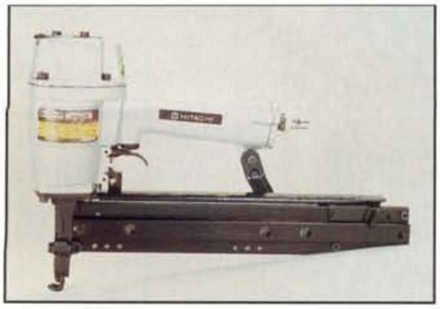
Fasco F3T FN70 The F3TFN70 from Fasco has that little bit more to make it stand out from the rest. This nailer handles the longest fasteners, up to 2¾", of all the tools we tested. It even passed the 12/4 oak test with this additional length. The results on the pine were also acceptable. We like the magnetic strip, standard on all the Fasco nailers, that holds the fasteners in place during loading and unloading. The two finger trigger and nice balance make this tool a pleasure.



Fasco F3C GN50 After firing the first few nails into the oak, we had to stop and double check if the nailer was actually firing fasteners. It turns out it was, but compared to the rest of the tools, you couldn't tell. There is no recoil at all and the tool is particularly quiet. One of the reasons is the fasteners are 18 gauge instead of 14–16 gauge like the majority of the tools. At just over 5 pounds, it's not the lightest, but it certainly isn't the heaviest and it makes up for the weight with its power. The F3CGN50 also left the cleanest and smallest entry hole.

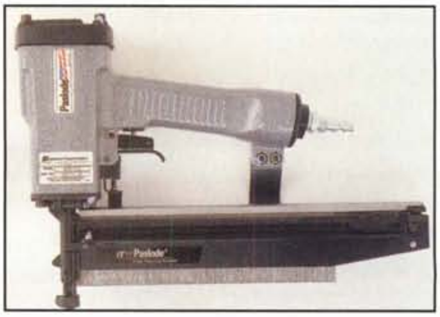
Fasco F4BA–65 All the Fasco tools have a little something extra to make them stand out. Besides being a finely balanced angled nailer, the F4BA–65 has the connector angled off to one side. This is a noticeable improvement over other angled nailers. When we tested them overhead, as one would when installing crown molding, the air hose didn't wrap itself around the operator's arm. The 12/4 oak was no match for this tool—it left nails set flush to the surface of the wood.

Haubold SKN 64A/16 Just picking this tool up you can tell that it's a fine instrument. This German–made finish nailer is often copied but not equaled. The balance and power are excellent. The range of nails is 1 3/16" to 2½" and it has no problem driving 2½" nails into the oak. There was no marring on the pine and it left a clean entry hole. This tool has about the best power to weight ratio of all the nailers.



Hitachi NT65A The Hitachi NT-65A is one of the best straight nailers we tested. At 4 lbs 7 oz, it ranks as a feather–weight. The magazine holds 50% more nails than nearly all the other tools. The tool performed consistently well in all of our performance tests and is worthy of serious consideration. Opening the nose piece is actually easier than some of the tools with spring clips even though it requires the removal of one screw. This unit performed well even after firing thousands of fasteners.

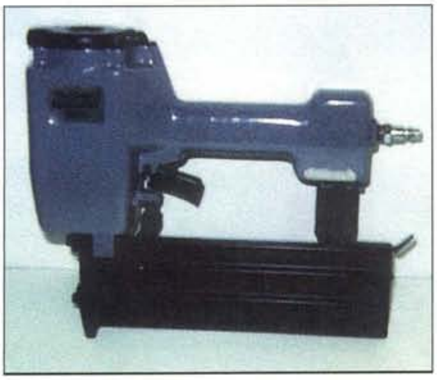
Paslode IM250F This tool comes as close to power nailer nirvana as one can. It's packaged in a lockable kit with a battery charger, NiCad battery and safety glasses. There's room for fasteners, extra batteries and fuel cells. It handles up to 100 16 gauge nails from ¾" to 2½" long. It performed flawlessly and has more than enough power to drive a 2½" nail into the 12/4 oak. Although it didn't jam during testing, a fix would have been quick and easy with the latch mechanism. It takes longer to remove the battery than to open and close the access panel. There is a premium price —it costs about the same as a pneumatic nailer, compressor, hoses, and fittings all together.



Paslode 3250–F16 The people that brought you the cordless nailer started out with a great pneumatic nailer. The 3250–F16 has some of the same features of the cordless. It has the same latch for quick and easy access to clear jams and the contact tip offers excellent target visibility for accurate placement. The balance and the feel of the 2–finger trigger make it a joy to work with and it performed well in all tests. It is able to countersink a 2" nail in 12/4 oak with no marring, even on the pine. Paslode packs a great deal of performance into one of the lightest tools tested. When you're done using this tool, it packs nicely into its lockable plastic kit for safe keeping.

Penn State ANK2 The ANK2 is really more of a brad nailer than a finish nailer. It will fire 2" nails and performs well in oak and left no marring on the pine. Had this been an evaluation of brad nailers, it would have been one of the best. The ANK2 comes in a handy kit box with fasteners, oil and spare parts. If you need to drive fasteners up to 2" in length and you don't need the strength of a 15 or 16 gauge nail, then this nailer is a good choice.

Penn State ANK3
The ANK3 is a straight collated 2" finish nailer. It passed the oak test with no problem and the entry hole was good. There was some marring on the surface of the pine. We had a few problems with the nailer that we tested. The clip which holds the magazine closed is not very strong and the magazine can open and let the nails fall out. There is also a sharp metal tab on the trigger that's irritating.



Reliant DD211
The DD211 is a large and bulky nailer, but isn't as heavy as it looks. Actually, of all the tools we tested it falls in the middle of the weight range. This finish nailer has a nice feel and is well balanced. It performed well in the oak, and equally well in the pine. It's a reasonable choice among the imports.

Sears 9GT18322
The Sears model 9GT 18322 is the same tool as the Dayton 6W533. Prices and warranties may vary between dealers. Check for the best price, warranty and availability.

Sears 9GT18315
The *Sears model* 9GT18315 is the same tool as the Dayton 6W531. The prices and warranties may vary between dealers. It is suggested that you check for the best price warranty and availability.

Senco SFN–1
This is the lightest of all the angled nailers we tested, and overall only one nailer weighed less. This 2" angled finish nailer is one of the finest available today. Like other Senco products, it is superbly balanced and is well suited for left as well as right handed operation. The SFN–1 passed the performance tests with flying colors. It had no problem with the 12⁄4 oak and left no marring and a clean entry hole in the pine. This tool would have been one of our favorite angled nailers had it not been edged out by its bigger brother.

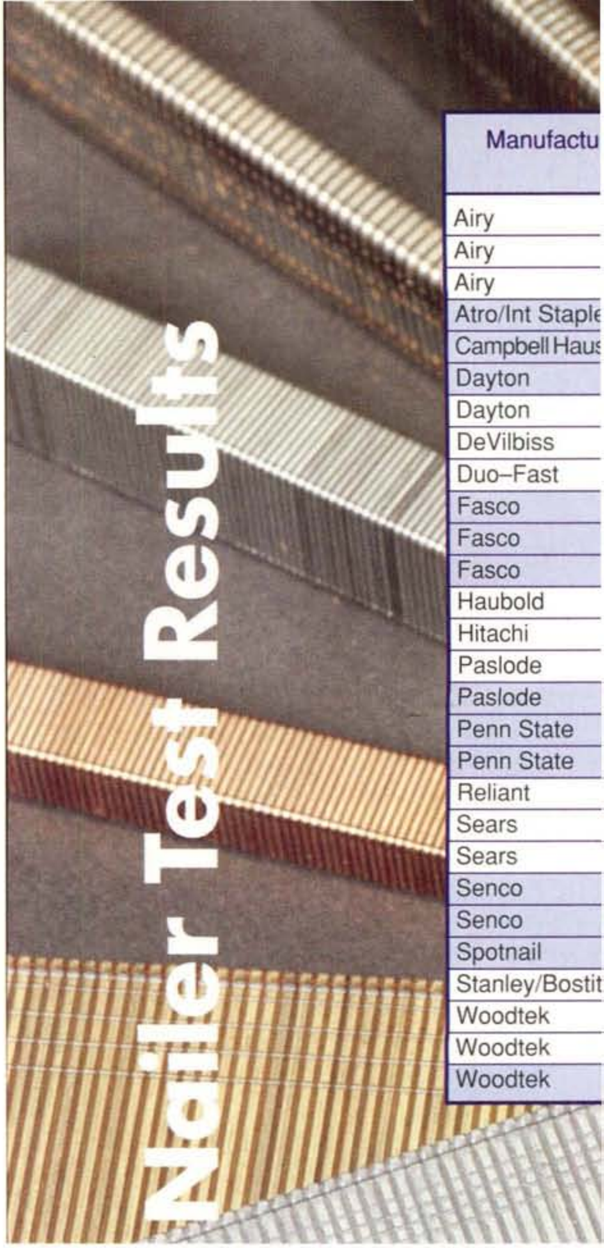
Senco SFN–40
The SFN–40 is a new model from Senco. This 2½" angled finish nailer is one of the lightest we tested. It's superbly balanced and is well suited for left and right handed operation. The plastic–coated loop contact tip has hash marks to aid in accurate fastener placement and it allows good visibility of the target area. It's one of the most comfortable tools we used. The standard leather grip is a welcome relief compared to metal handles. The SFN–40 passed the performance tests successfully. It had no problem with the 12⁄4 oak and left no marring and a clean entry hole in the pine. This tool was one of our favorite angled nailers.

Spotnail HLB1516 This 4½ pound tool made mincemeat out of the oak. The Spotnail people really pack a lot of punch into this package. We really like the way this tool feels and handles. The large trigger is convenient to use with either one or two fingers. The profile of the head and nose piece make for excellent target location. Overall the HLB1516 is an outstanding finish nailer.

Stanley/Bostitch N60FN-2 The Stanley/Bostitch N60FN is available in either trigger action, contact-trip, or sequential-trip. We tested the sequential because we like the safety type of trigger provides. The tool is lightweight and well balanced. It comes in a steel carrying case with an assortment of nails and a generous supply of lubricating oil. We like the rubber grip on the handle. The Dial-A-Depth™ variable control lets you set the depth from countersink to protruding. There are two drawbacks—the amount of pressure needed to pass the oak test and proprietary nails. We had to set the compressor at maximum to drive a nail into the oak. As the pressure sagged before recycling the depth decreased. This nailer uses a different collation angle, but Bostitch nails are readily available.

Woodtek 864-392 We like this nailer from Woodtek almost as much as we like the model 864-374. It passed the 12/4 oak test and there was no noticeable marring on the pine. It's in the middle of the weight range for angled nailers. The balance is fine and the trigger is comfortable. The one thing we don't like is its tendency to double fire fasteners, particularly when we bounce fired. This, however, may be avoided once experience is gained with the tool. It represents a good value *in a finish nailer.*

Finish Nailer Test Results



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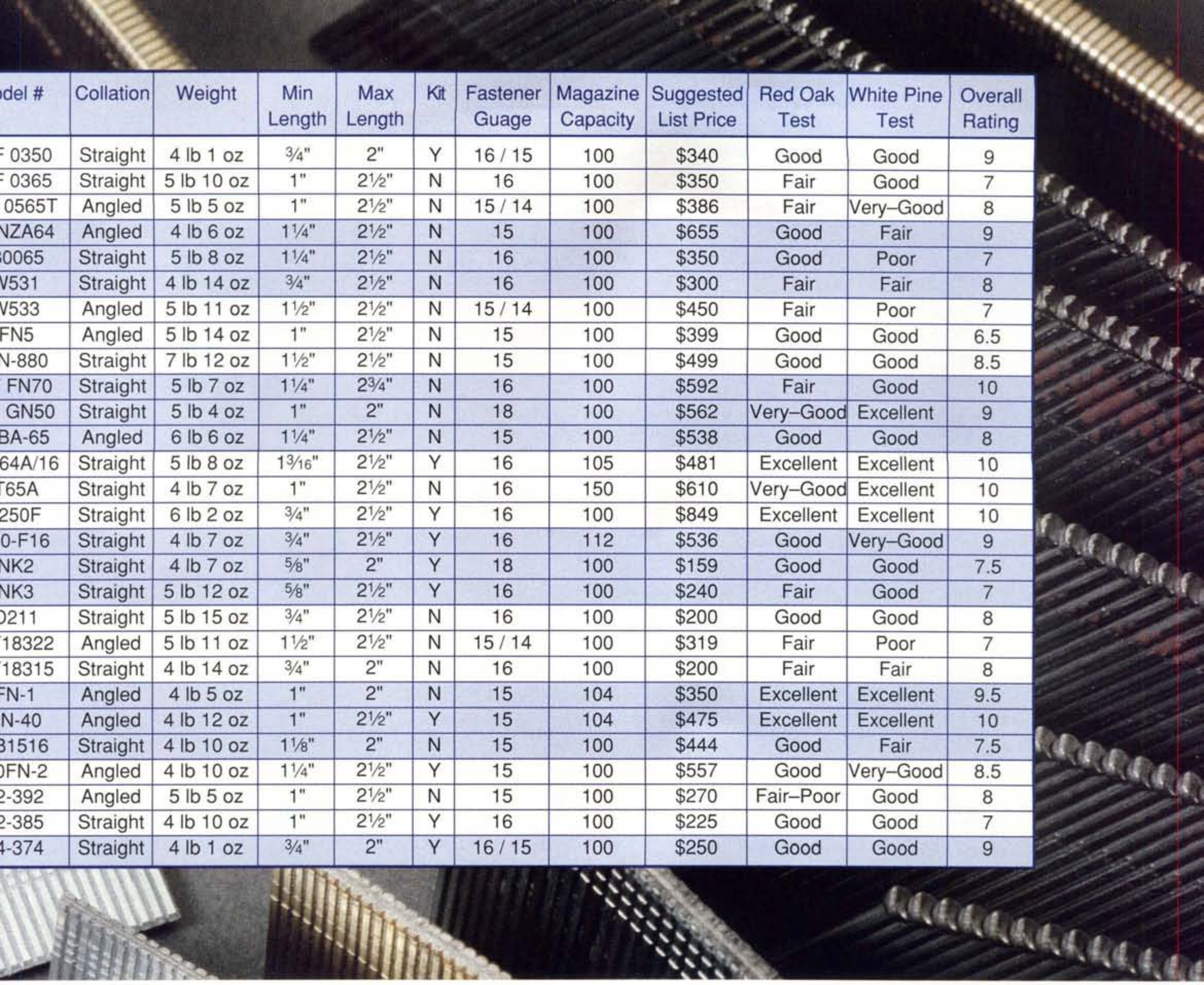
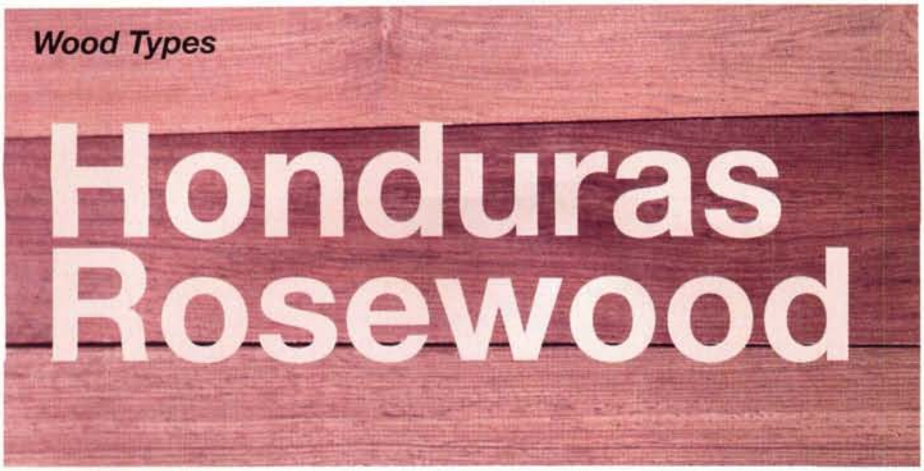


del #	Collation	Weight	Min Length	Max Length	Kit	Fastener Guage	Magazine Capacity	Suggested List Price	Red Oak Test	White Pine Test	Overall Rating
F 0350	Straight	4 lb 1 oz	¾"	2"	Y	16 / 15	100	$340	Good	Good	9
F 0365	Straight	5 lb 10 oz	1"	2½"	N	16	100	$350	Fair	Good	7
0565T	Angled	5 lb 5 oz	1"	2½"	N	15 / 14	100	$386	Fair	Very–Good	8
NZA64	Angled	4 lb 6 oz	1¼"	2½"	N	15	100	$655	Good	Fair	9
0065	Straight	5 lb 8 oz	1¼"	2½"	N	16	100	$350	Good	Poor	7
V531	Straight	4 lb 14 oz	¾"	2½"	N	16	100	$300	Fair	Fair	8
V533	Angled	5 lb 11 oz	1½"	2½"	N	15 / 14	100	$450	Fair	Poor	7
FN5	Angled	5 lb 14 oz	1"	2½"	N	15	100	$399	Good	Good	6.5
N-880	Straight	7 lb 12 oz	1½"	2½"	N	15	100	$499	Good	Good	8.5
FN70	Straight	5 lb 7 oz	1¼"	2¾"	N	16	100	$592	Fair	Good	10
GN50	Straight	5 lb 4 oz	1"	2"	N	18	100	$562	Very–Good	Excellent	9
BA-65	Angled	6 lb 6 oz	1¼"	2½"	N	15	100	$538	Good	Good	8
64A/16	Straight	5 lb 8 oz	1³⁄₁₆"	2½"	Y	16	105	$481	Excellent	Excellent	10
T65A	Straight	4 lb 7 oz	1"	2½"	N	16	150	$610	Very–Good	Excellent	10
250F	Straight	6 lb 2 oz	¾"	2½"	Y	16	100	$849	Excellent	Excellent	10
0-F16	Straight	4 lb 7 oz	¾"	2½"	Y	16	112	$536	Good	Very–Good	9
NK2	Straight	4 lb 7 oz	⅝"	2"	Y	18	100	$159	Good	Good	7.5
NK3	Straight	5 lb 12 oz	⅝"	2½"	Y	16	100	$240	Fair	Good	7
0211	Straight	5 lb 15 oz	¾"	2½"	N	16	100	$200	Good	Good	8
18322	Angled	5 lb 11 oz	1½"	2½"	N	15 / 14	100	$319	Fair	Poor	7
18315	Straight	4 lb 14 oz	¾"	2"	N	16	100	$200	Fair	Fair	8
FN-1	Angled	4 lb 5 oz	1"	2"	N	15	104	$350	Excellent	Excellent	9.5
N-40	Angled	4 lb 12 oz	1"	2½"	Y	15	104	$475	Excellent	Excellent	10
31516	Straight	4 lb 10 oz	1⅛"	2"	N	15	100	$444	Good	Fair	7.5
0FN-2	Angled	4 lb 10 oz	1¼"	2½"	Y	15	100	$557	Good	Very–Good	8.5
2-392	Angled	5 lb 5 oz	1"	2½"	N	15	100	$270	Fair–Poor	Good	8
2-385	Straight	4 lb 10 oz	1"	2½"	Y	16	100	$225	Good	Good	7
4-374	Straight	4 lb 1 oz	¾"	2"	Y	16 / 15	100	$250	Good	Good	9

Woodtek 864–385 The 864–385 is a straight nailer that, along with the Airy, looks like a Haubold nailer, but the similarities end there. We did like the exhaust port that can be redirected. This nailer is weighted towards the front end and that throws the feel and balance off. One feature we don't like is the switchability from contact–trip to trigger operation.

Woodtek 864–374 This nailer is a tool that's easy to pick as one of the best. It certainly has the most features of any of the other entries. The clear magazine cover lets you see how many fasteners are left and it flips open in case a jam has to be cleared from the magazine. The tools to maintain and adjust the nailer are stored in a compartment on the back of the magazine. The magazine also has accessory attachments and is calibrated to set fasteners at specific spacings from each other or from an edge. It also has an attachment to let you set the tool at a particular angle. PW



Honduras Rosewood

by Ken Textor

Although some rosewoods have recently been labeled taboo, Honduras rosewood is one species that hasn't been included on a rare or endangered species list. That's good news because Honduras rosewood has many of the attributes woodworkers want in a handsome tropical hardwood.

General Description

Over the years, four different rosewood species have topped the list of desirable tropical hardwoods: Brazilian rosewood, East Indian rosewood, cocobolo rosewood and Honduras rosewood. There are also several other minor imported rosewoods. But it is generally from these four that woodworkers have chosen.

Only Honduras rosewood (*dalbergia stevensonii*) is still inexpensive and readily available enough to be considered seriously by conscientious woodworkers. Other rosewoods are either on an endangered species lists published by concerned environmental groups, or they are governmentally controlled, with consequent high prices and poor availability. Lately, even the very high quality examples of Honduras are becoming somewhat scarce.

Honduras rosewood has no widely used English nicknames. But sometimes cocobolo is mistakenly bought or sold as Honduras rosewood. They are in the same genus, as are the other rosewoods. But all are different species, with different working qualities, grain, coloring and appearance. If it's being sold generically as "rosewood," stay away from it.

Honduras rosewood grows mainly in the Belize area of Central America. Although its distribution is narrow, and the soils on which it can grow are quite specific, it has until recently been widely available. Most Honduras rosewood trees are found along rivers. The tree grows to a height of 100 feet or more, with trunk diameters of about three feet. Branching usually begins about 25 feet from the ground.

As with other rosewoods, the lumber from Honduras rosewood is very hard and very heavy, with lots of potential for highly attractive figuring. The color can be quite variable. The heartwood can range from light or pinkish brown to dark brown, with purple or purple and brown streaking likely to occur in the best examples. The sapwood is distinctly yellow and a clear line of demarcation separates sapwood from heartwood. Within planks, the colors can be uniform or variable. The grain is generally straight and very fine, with occasional rosy effects in it. It has a fine, closed grain that shows a medium luster in bright light.

Honduras rosewood is highly resistant to rot and attack by termites. It does tend to dry out very slowly with a marked tendency to check at the ends of boards. But overall shrinkage is very small, on a par with white cedar (see *PW* #65). Once dried, it is among the most stable woods in the world. Movement is minimal, which is why it is so prized as a fine furniture wood, billiard cues and the like.

Because of its relatively high price, Honduras rosewood is often limited to furniture trim, and is seldom used throughout an entire piece of furniture these days. It is also commonly used in wood sculpture, musical instruments, knife handles, brush backs, tool handles and tool parts, fine turnery items, numerous small specialty items, and all sorts of veneer projects.

Working Properties

As with other rosewoods, working with Honduras rosewood is fairly easy. In the planer, it generally goes through without much fuss. Its inherent hardness requires taking off only 1⁄16" each pass. Using a hand plane on it yields good results although

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***Ken Textor** works wood and writes about it in Arrowsic, Maine.*

you have to put some muscle into it.

With such good results from planing, extensive sanding is seldom required. Cross–cutting, ripping and boring procedures are also basically problem–free. In routing and shaping, the wood's hardness usually requires that the piece be run through more slowly than other hardwoods.

When working Honduras rosewood with any tools, you may notice that it generally produces a little more dust in the air than normal. It's not quite as bad as mesquite (see *PW* #73), but it is pretty dusty. This may be part of the reason some woodworkers have developed severe allergic reactions to the wood. For some people, just a whiff of the wood's characteristically pleasant rose/cinnamon odor can produce bouts of watery eyes and sneezing.

On the lathe, Honduras rosewood is a blessing. Shavings come off smoothly and easily. The finished surface is almost finish–ready. But tools must be very sharp for the best results. Sharp edges also prevent overheating which can pull the temper out of the steel.

Honduras rosewood holds fastenings extremely well. You must use properly–sized pilot holes, both for nails and screws. The wood resists splitting from fastenings very well. But without proper pilot holes, fastenings crumble or twist off. Lubricants for screw fastenings are also a help.

All glues work well with Honduras rosewood. The tight grain makes glue pockets for epoxy necessary. I found no significant staining with any glues.

Finishing

It's rare to see any finish on Honduras rosewood other than a clear finish. I found that low–luster finishes produced better results than high–luster finishes. It seemed that mirror–like finishes compete unnecessarily with the natural highlights in the wood's grain. Semi–gloss and no–gloss "antique" finishes solved this problem. Clear shellac was the best choice. Clear oils also produced good results.

Unfortunately, the clear, environmentally–friendly water–based finishes yielded poor results. The vaguely milky appearance of these finishes muted the wood's inherent highlights. Clear waxes weren't much help either. Likewise, stains and paint seemed self–defeating.

Light sanding with 220–grit paper between coats nearly guaranteed a very smooth finish. If you use a tung oil finish, sand up to about 400–grit for the best results. Indeed, you can keep polishing this wood right up to 600–grit, leave it unfinished and still have a very handsome piece.

Availability

Reports on the current availability vary. Highly attractive woods may be more difficult to find than plainer examples. Heavy lumbering in recent years has sent much of the best rosewood to market. With pressure from environmental groups, this wood can still be found at most well–*stocked, tropical* hardwood outlets in North America.

Much of the Honduras rosewood imported today ends up as veneer. That's partly because the price for the solid wood—$10 to $22 per board foot—is so high. The variability in price is due to the variability in color and grain patterns. Uninteresting grain and color is cheaper. Veneers can be purchased at prices between $1.20 and $2 per square foot. Usually, it's easier to get a highly attractive rosewood in veneer. I found it's relatively easy to get book–matched veneers, but much harder to get solid book–matched boards. (Book–matched means one board looks like a reflection of the other board, much like opposite pages of a book.)

Dimensional Honduras rosewood is unavailable outside of its native habitat. But 4" and sometimes 6" turning blocks are available from some dealers. And once in a while, highly figured burls are available from retailers on a catch–as–catch–can basis.

In any case, Honduras rosewood seems to be playing the tune that frugal woodworkers want to hear today. And considering that it has been a traditional wood used in xylophones, it's a melody you can hear both literally and figuratively. PW

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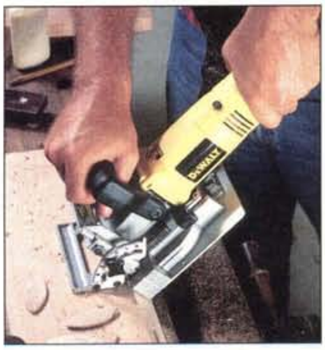
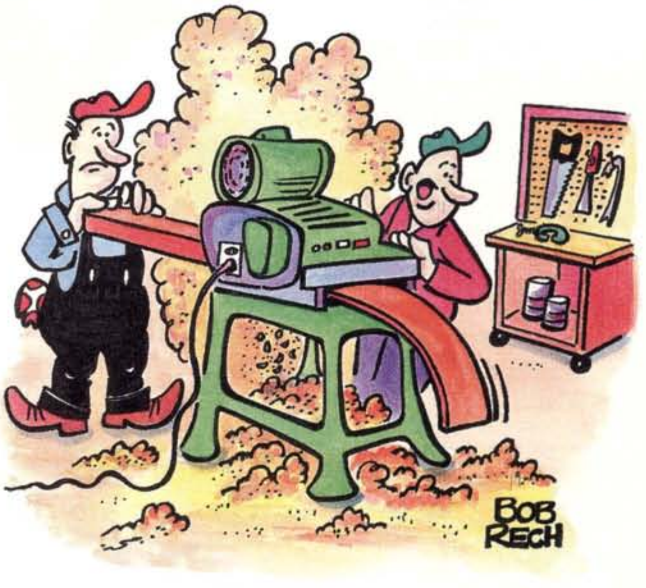
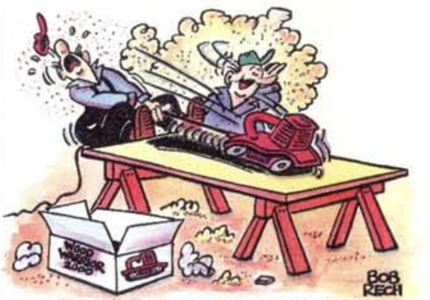
sponsored by DEWALT High Performance Industrial Tools & Accessories

Submit you captions for this cartoon on a postcard to *Popular Woodworking*, Cartoon Caption #6, 1041 Shary Circle, Concord, CA 94518. The deadline for entries is June 1, 1994. Entries will be judged by the woodworking staff. A winner and two runners up will be chosen.

The two runners up will each receive a one year subscription to *Popular Woodworking*. The winner will receive the new DeWalt Plate Joiner, model DW682K. State–of–the–art features include: integral tilting fence with rack–and–pinion height adjustment; retractable steel anti–slip pins on the base; a 6.5 amp, gear driven 100 percent ball bearing motor; and a top handle for added control. Additionally, the Plate Joiner comes with a one–year free parts, labor and loaner tool warranty.







"You want I should unplug it?"

AND THE WINNER IS...

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Mark Holdsworth, from Rockford, Michigan

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"That doesn't need a dust bag, it needs a parachute!"

Alan Hamerstone, from Lawrenceville, New Jersey

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by Bryan Mills

Why Work Wood?

"Why go to all the work and expense of building a chair or table when you can buy one at a rummage sale or second–hand store?"

Donald Brooks, Popular Woodworking, January 1993, p. 7.

Several years ago, I helped a kid build a pair of speaker boxes. It was a long winter at one night per week. He could have purchased two second–hand units and saved some money, and a whole lot of time. A month after the successful project was finished, a grateful mother said I had changed her son's life—an overstatement to be sure, but this father–starved kid got the full attention of an adult in the wood shop. For the first time in his life he had felt a sliver of meaning.

In private woodworking shops individuals discover meaning. Think now. Would any woodworker you know make that proclamation? Heavens no! Midst the shavings and dust, the scattered tools and unfinished projects, little philosophizing goes on. Count on it. But beneath the razzle–dazzle of modern, personal woodworking lies an unreported event—the discovery of a sliver of meaning in life.

Look what happens when someone has the image of a wooden object in their mind and sets out with lumber and tools to bring it into existence. The woodcrafter sees the evolution, touches it, hefts it, places it, uses it, sells or donates it. In this ordinary transaction can be observed the conception of an idea, the invention of a means to solve its construction problems, the pleasure of manipulating tools, and the satisfaction of cutting and fitting wood pieces. The exercise pumps blood, generates energy and taunts the nerves. But in the end, most likely throws up a quiet, private sensation of accomplishment. A reflective woodworker says inaudibly, "It meant a lot to me to be able to build that." There lies the sliver of meaning—the unspoken essence of woodworking.

Few of us ever find an over–all, life–long meaning or purpose in life. We experience meaning sliver by sliver. Some, I for one, have had our slim meaning–base jerked from us from a job loss, which sometimes comes with the cruel collapse of vocational identity—the agony of which must be quietly endured. Many of us have survived the trauma, without therapy or support groups, through the production of wooden objects from a simple shop.

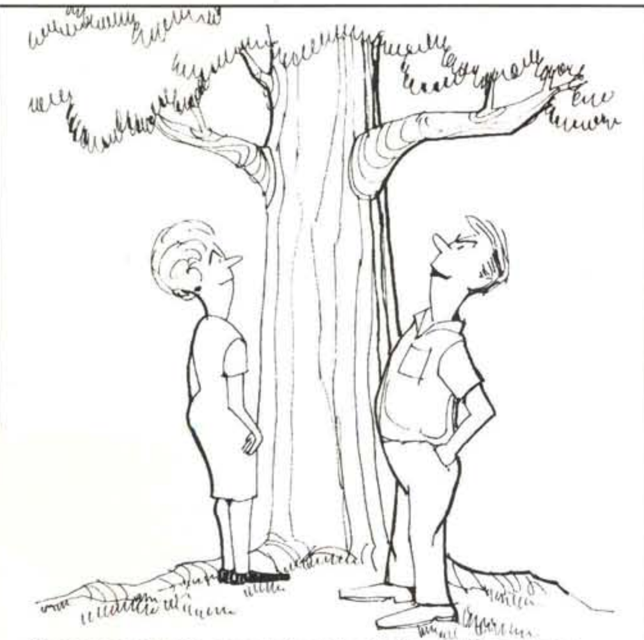
If one allows it to happen naturally, the act of woodworking is void of charades or phoniness. The shop work separates a person from the chaos and competitive politics of modern institutional and industrial life. For many, step–by–step shop procedures provide a temporary, if not steady, structure to life. In the shop setting, a person can be what he or she wants to be. No double talk here. No pretending. No power struggle for position and no authority figures to placate. Here a person can be real. Here one can find the center of his or her being.

In the shop you're connected with nature through wood—a substance of the earth's nurturing on mountainsides through decades of blizzards and summer heat. To the woodworker is revealed the natural beauty of abstract wood grain and the gentle fragrances of timber. A tool put to work connects a woodworker to the life–sustaining tradition of tool making and tool use. When the object is completed, the woodworker has lived out the human urge to invent and build, and in the process has gained a renewed sense of identity and meaning which mass–production and group–think tramples.

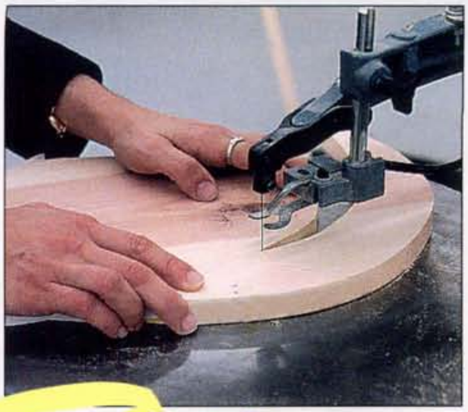
Fifty–some years ago, coming out of the Great Depression, I got my first woodworking tools. An initial project was a walnut magazine rack. A bit tacky. But today, it sits in my daughter's elegantly modern living room. She says she would not part with it for any price—it has special meaning for her. So, strange as it may seem to an outsider, a woodworker not only discovers a sliver of meaning in their life, but may also create some for another.

Thus, by a long shot, a stranger cannot perceive all that goes on in a woodworking shop. PW

***Bryan Mills** is a writer and maker of fine furniture in Williamsport, Pennsylvania.*



"I would estimate approximately 3873 sets of salt and pepper shakers in it."



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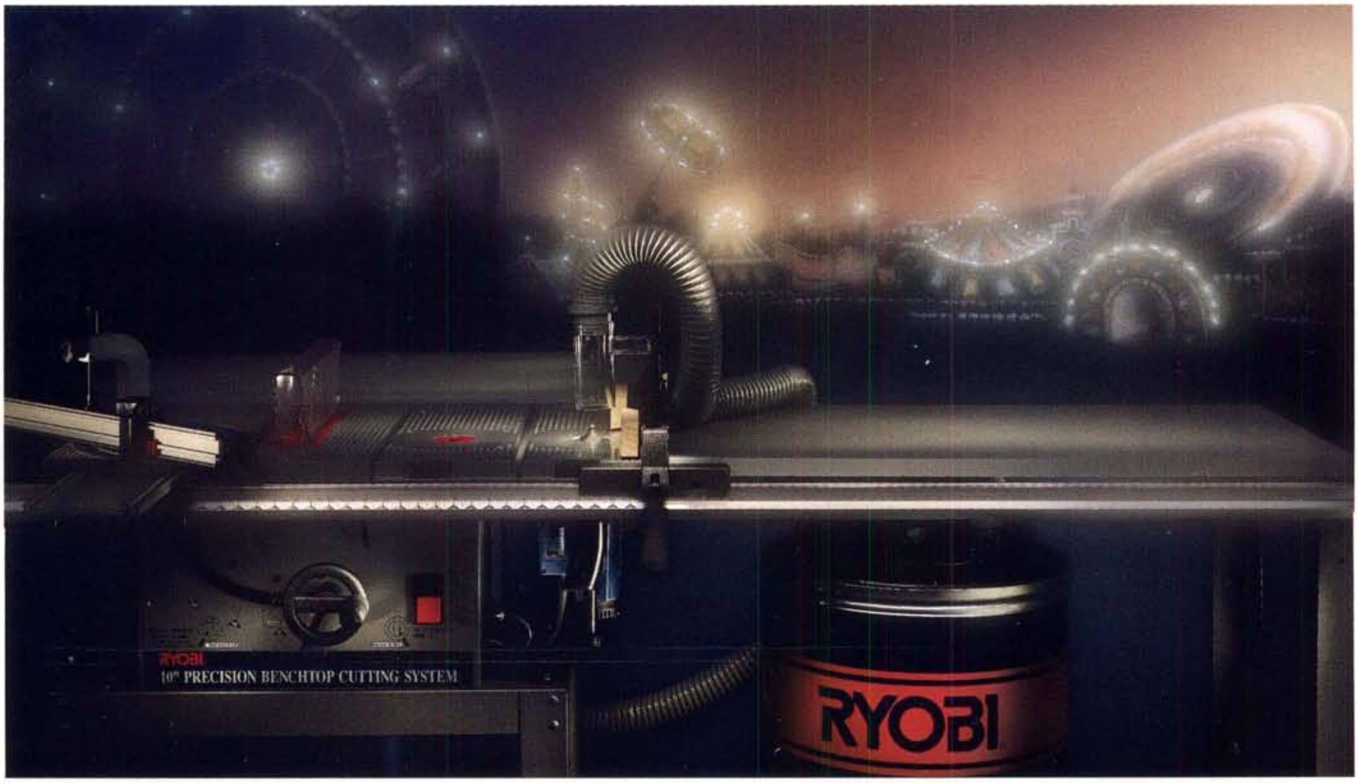

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